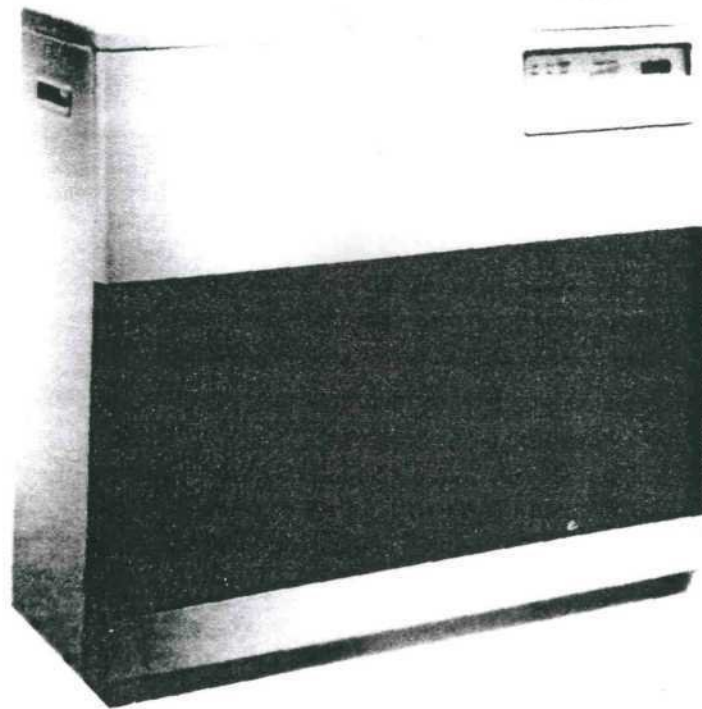


# **MONITOR GF500**

## **Vented Heating System**

# **Service Manual**



The information contained herein is proprietary to Monitor Products, Inc. shall not be disclosed, duplicated, nor otherwise copied in whole or part for any other purpose without express written permission of the Legal Department of Monitor Products, Inc. This data is issued to authorized Monitor Servicing Personnel for guidance in the installation and maintenance of the subject product and is intended for use by authorized Monitor service personnel only. Further, Monitor Products, Inc. reserves the right to make improvements and corrections and to alter specifications of products described herein, at any time without prior notice.

**Monitor Products, Inc.**  
**7A & 7E Marlen Drive**  
**Robbinsville, 08691**

# MONITOR HEATING SYSTEM

## Table of Contents

---

<b>Section 1: Description .....</b>	<b>Page 1 ~ 7</b>
1-1 Specifications; 1-2 Special Features; 1-3 Safety Features; 1-4 Manual Gas Valve; 1-5 Automatic Gas Valve; 1-6 Gas Control Valve; 1-7 Burner; 1-8 Orifice; 1-9 Ignition Plug Unit; 1-10 Ignition Transformer; 1-11 Flame Detector; 1-12 Combustion Blower; 1-13 Heat Exchanger; 1-14 Flue Pipe; 1-15 Air Circulation Fan; 1-16 Air Pressure Switch; 1-17 Overheat Protector Switch; 1-18 Thermal Fuse; 1-19 Overcurrent Fuse; 1-20 Electrical System; 1-21 Microprocessor; 1-22 Temperature Sensor; 1-23 Safety Mechanisms; 1-24 Cloth Covered Exhaust Pipe; 1-25 Air Circulation Fan Guard; 1-26 Slide Selector For The Reset Temp.	
<b>Section 2: Installation .....</b>	<b>Page 9 ~ 15</b>
2-1 Notice Before Installation; 2-2 Heater Installation; 2-3 Flue Pipe Clearances; 2-4 Installing An Extension Kit; 2-5 Gas Connection; 2-6 Gas Conversion Procedure; 2-7 High Altitude Installation; 2-8 Manifold Pressure Readings	
<b>Section 3: Operation .....</b>	<b>Page 17 ~ 25</b>
3-1 Introduction; 3-2 Operating Specifications; 3-3 Operating Controls And Indicators; 3-4 Pre-operation Check List; 3-5 Operation; 3-6 Manual Heater Operation; 3-7 Automatic Heater Operation; 3-8 Reprogramming The Monitor Heater; 3-9 Heat Sensor; 3-10 Monitor Shutdown; 3-11 Recovery From A Power Failure; 3-12 Recovery From Overheat Condition; 3-13 Recovery From Blown Fuse; 3-14 Operation Control System	
<b>Section 4: Maintenance/Serviceing .....</b>	<b>Page 27</b>
4-1 Cleaning The Cabinet; 4-2 Checking The Flue Pipe; 4-3 Cleaning The Interior; 4-4 Cleaning The Blower Guard; 4-5 Electric Motor Maintenance; 4-6 Checking The Burner Flame; 4-7 Cleaning The Burner	
<b>Section 5: Troubleshooting .....</b>	<b>Page 29 ~ 51</b>
Resistance Values Component Voltage Readings Test Point Voltage Troubleshooting Diagrams (Mechanical / Electrical) Indication of Failure Mode	
<b>Section 6: Electrical System .....</b>	<b>Page 53 ~ 55</b>
Schematic Wiring Diagram	

# MONITOR HEATING SYSTEM

## Section 1: Description

### 1-7 BURNER

This burner is a Bunsen type with a specially structured flame port section, which shapes and positions the flame, so it can be wrapped by the secondary air flow, and burn completely.

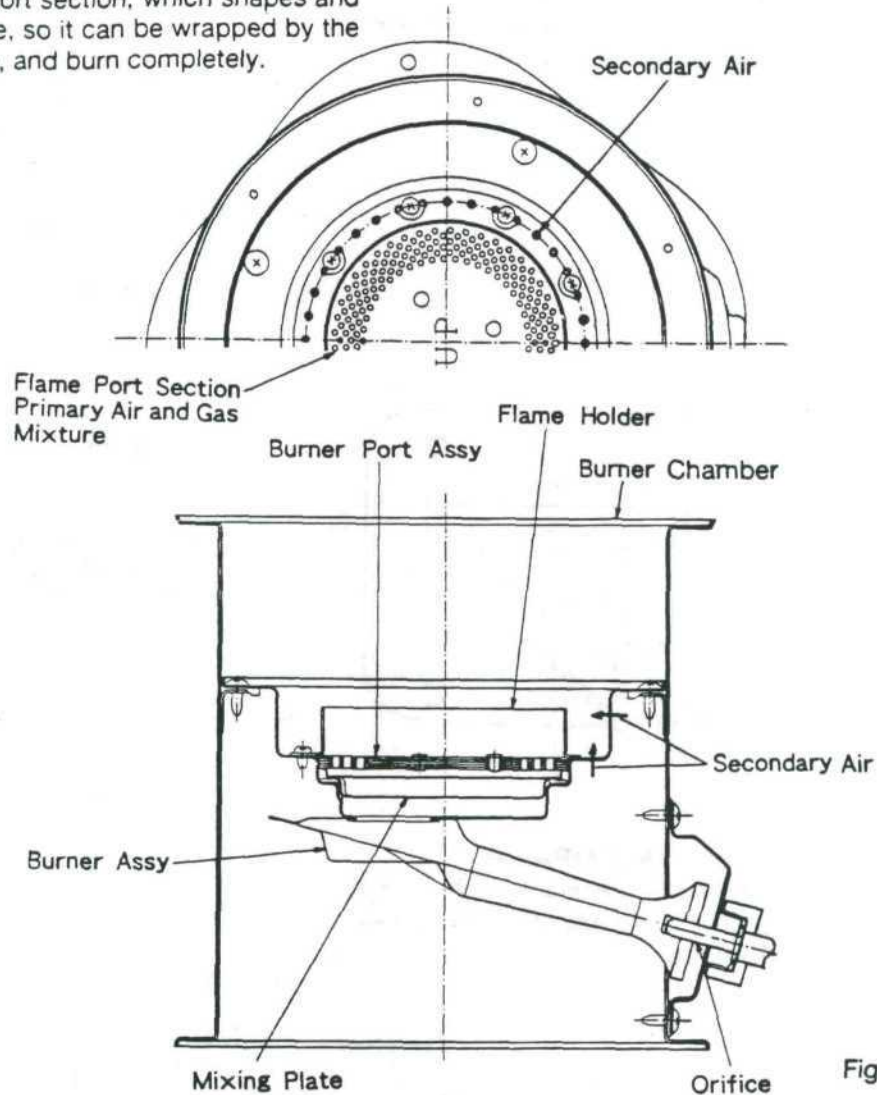


Figure 1-4

### 1-8 ORIFICE

The orifice is made of brass, inserted into the gas passage of the mixer, and fixed by the gas pipe.

#### NOTE:

For altitude applications over 2,000 feet refer to page 15.



#### WARNING:

Use of incorrect orifice will create a fire hazard and damage unit.

Gas Type	Natural	LP
Shape, Stamp		
Orifice size	Dia 3.50mm	Dia 2.64mm



# MONITOR HEATING SYSTEM

## Section 1: Description

### 1-9 IGNITION PLUG UNIT

The Electrode is applied high voltage, and discharges to the Grounding Rod to ignite the burner. The discharge gap between the Electrode and the Grounding Rod is  $3.5 \pm 0.8$  mm.

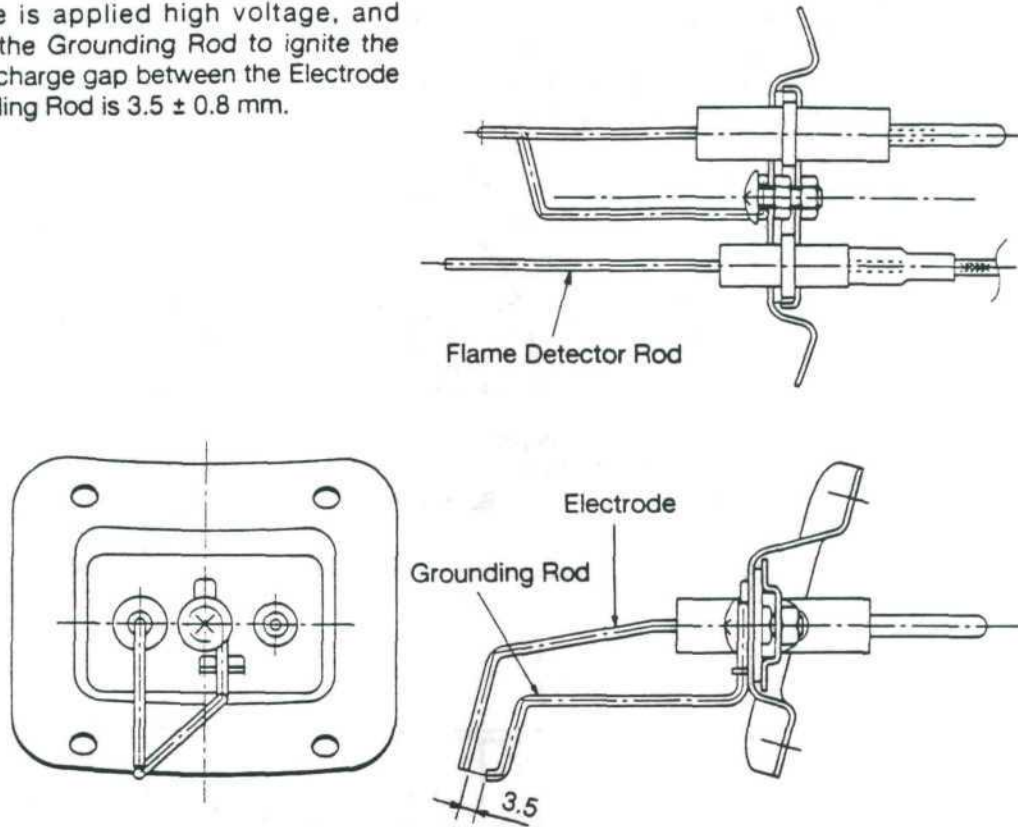


Figure 1-6

### 1-10 IGNITION TRANSFORMER

The Ignition transformer generates high voltage using 120 VAC power, discharged by the Ignition plug to ignite the burner.

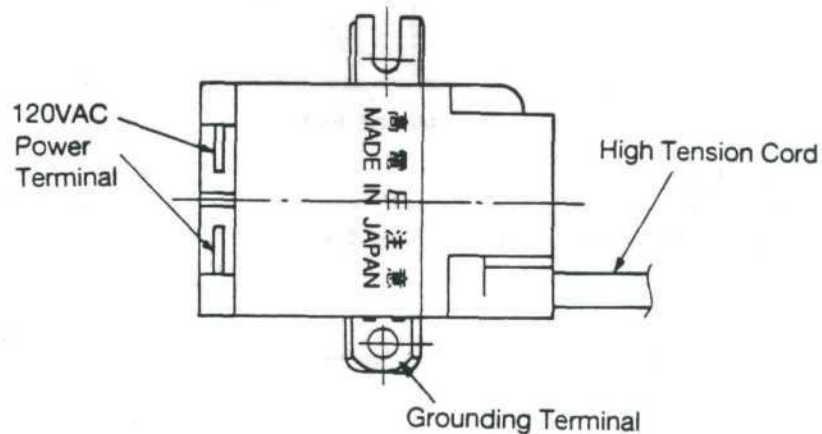


Figure 1-7

**⚠ WARNING:**  
Do not touch when functioning. High voltage of 15 kV is generated.

# MONITOR HEATING SYSTEM

## Section 1: Description

### 1-11 FLAME DETECTOR

An Electrode which detects that the burner has been ignited, using the flame as a conductor, instantaneously detects when the flame extinguishes and shuts down the Automatic Valve.

### 1-12 COMBUSTION BLOWER

The Combustion Blower has a two stage intake fan. The intake fan draws in outside air thru the flue pipe for internal combustion.

Burner modes control fan speeds and the Solenoid Damper in the Blower Casing. Those functions are as follows:

#### COMBUSTION AIR CONTROL

Burn Mode	Fan Speed	Solenoid Damper
High	High	Off (open)
Low	Low	On (close)

Setting air flow for Solenoid Damper on Low mode should read  $9 \pm 0.5$  mm for Nat. and  $8.4 \pm 0.5$  mm for LP.

### 1-13 HEAT EXCHANGER

An inlet at the top of the Heat Exchanger permits the heated air to travel from the Combustion Chamber into the Heat Exchanger.

An outlet, at the bottom of the Heat Exchanger, permits combustion by-products to be vented to the Flue Pipe.

While moving through the Heat Exchanger, the hot air within the Heat Exchanger heats the outside metal walls. The hot metal walls, in turn, heat air that is pushed past the Heat Exchanger and is circulated into the room. An air baffle, directly in front of the Heat Exchanger, deflects the heated air downwards, and out, through the Louver assembly.

### 1-14 FLUE PIPE

Flue Pipes are available in three (3) sizes. This provides the flexibility to meet the installation requirements for dwelling of various wall thicknesses. One side of the Flue Pipe contains a "T"-shaped fitting consisting of four ports. This side is mounted on the interior wall of the dwelling. The pipe side of the Flue Pipe is vented outside the dwelling. The Flue Pipe assembly consists of two concentric tubes. Outside air is drawn through the cylindrical space between the tubes.

As the cool air enters, it is heated by the hot air that is exiting the system.

A large-bore, flexible hose connects the air inlet port on the Flue Pipe with the Combustion

Blower; a cloth-covered metal pipe connects the Heat Exchanger with the exhaust outlet on the Flue Pipe.

### 1-15 AIR CIRCULATION FAN

The Circulation Fan is driven by a two speed motor and is designed to circulate the heated room air. If the heater is running in low burn mode, the fan also runs at low-speed; in high burn mode, the fan advances to high-speed. Operation of the fan is controlled by the Microprocessor and Fan Thermostat Switch. Physically assembled with a protective wire cage, the entire fan assembly is secured to a bracket on the rear of the Heater Cabinet. A sheet metal conduit, at the rear of the Heater, protects the fan wiring from damage.



# MONITOR HEATING SYSTEM

## Section 1: Description

### 1-16 AIR PRESSURE SWITCH

This switch consists of a rubber diaphragm which senses changes in air pressure (it is connected to the Combustion Blower and the Combustion Chamber) and a normally-open, micro switch.

Should an abnormal pressure differential exist, the switch opens to disable the circuitry that controls the supply of gas. Since the flow of gas to the Burner is cut off, the flame extinguishes, and the burner Status Indicators blink.

This safety mechanism can be triggered by several conditions:

- Leak, loose, or broken tubing which connects the Air Pressure Switch with the Combustion Blower or the Combustion Chamber
- Clogged or blocked Air Line
- Blocked or clogged Flue Pipe
- Intake port of the Combustion Blower is blocked
- Combustion Blower is inoperable

### 1-17 OVERHEAT PROTECTOR SWITCH

The normally-closed Overheat Protector Switch safeguards the heaters against damage due to overheating.

The Switch is rated 115°C (239°F). Should a Monitor overheat (internal temperatures rise beyond 115°C/239°F) switch will open to shut down the heater. After extinguishing the flame, the Burner Status indicators continue to blink. The Overheat Protector Switch will automatically reset after cooling down. Once the heater has cooled to 90°C(194°F), the system can be restarted. To restart the Monitor, proceed as follows:

- A. Press ON/OFF Switch to OFF.
- B. Allow heater to cool.
- C. Troubleshoot the cause of the overheat.
- D. Press ON/OFF switch to ON.
- E. Proceed with normal operation.

### 1-18 THERMAL FUSE

Should Overheat Protector Switch malfunction, and the heater be further overheated, the thermal fuse(internal temperatures rise beyond 145 °C/293°F) melts and prevent further overheating.

### 1-19 OVERCURRENT FUSE

2-amp., 125VAC, fuse protects the heater from damage resulting from power overloads. In the event of a power surge or internal wiring hazards, the fuse opens and power to the heater is cut off.

### 1-20 ELECTRICAL SYSTEM

Electrical power is supplied to the Monitor to run the Microprocessor and the other electrically-energized component.

Electrical operation of the Monitor can be thought of as having the following eight(8) distinct phases: plug in; turn on; pre-purge; ignition; pre-combustion; heating; shutdown and post-purge.

### 1-21 MICROPROCESSOR

Principally consisting of a 64-pin Integrated Circuit, the Microprocessor provides safety timings, controls relays and provides clock and thermostat functions for the Monitor heater.

### 1-22 TEMPERATURE SENSOR

The sensor which is capable of sensing room temperature within a range of 42°F to 96°F, can be left mounted on the back of the heater cabinet or be wall mounted.

Approximately 6 1/2' (about 200 cm) of No. 20 AWG Wire is supplied with the sensor to facilitate wall mounting the sensor in a favorable location.

### 1-23 SAFETY MECHANISMS

Several safety mechanisms have been built into the Monitor Heating System. These devices protect the user against personal injury, protect the heater against damage, and shutdown the heater if a malfunction occurs.

### 1-24 CLOTH COVERED EXHAUST PIPE

Insulating cloth covers are to be placed over all metal surfaces of the Exhaust Line during installation. Since combustion by-products are vented at elevated temperatures, the Exhaust Pipe will become hot during operation. The insulating cloth covers protect the user from burn hazards associated with accidental contact with these heated metal surfaces. During installation make sure that all Exhaust Lines are tight. Do not operate the heater without the insulating covers.

### 1-25 AIR CIRCULATION FAN GUARD

This guard is an integral part of the fan assembly. The guard protects the user against physical injury which could occur from accidental contact with revolving metal fan blade.

### 1-26 SLIDE SELECTOR FOR THE RESET TEMP.

Once power is restored after power interruption by power failure or by disconnecting heater plug from wall outlet, heater will resume operation in the MANUAL mode and maintain room temperature according to the setting temperature selected by using the selector for the reset temperature at the lower right hand side of the cabinet.

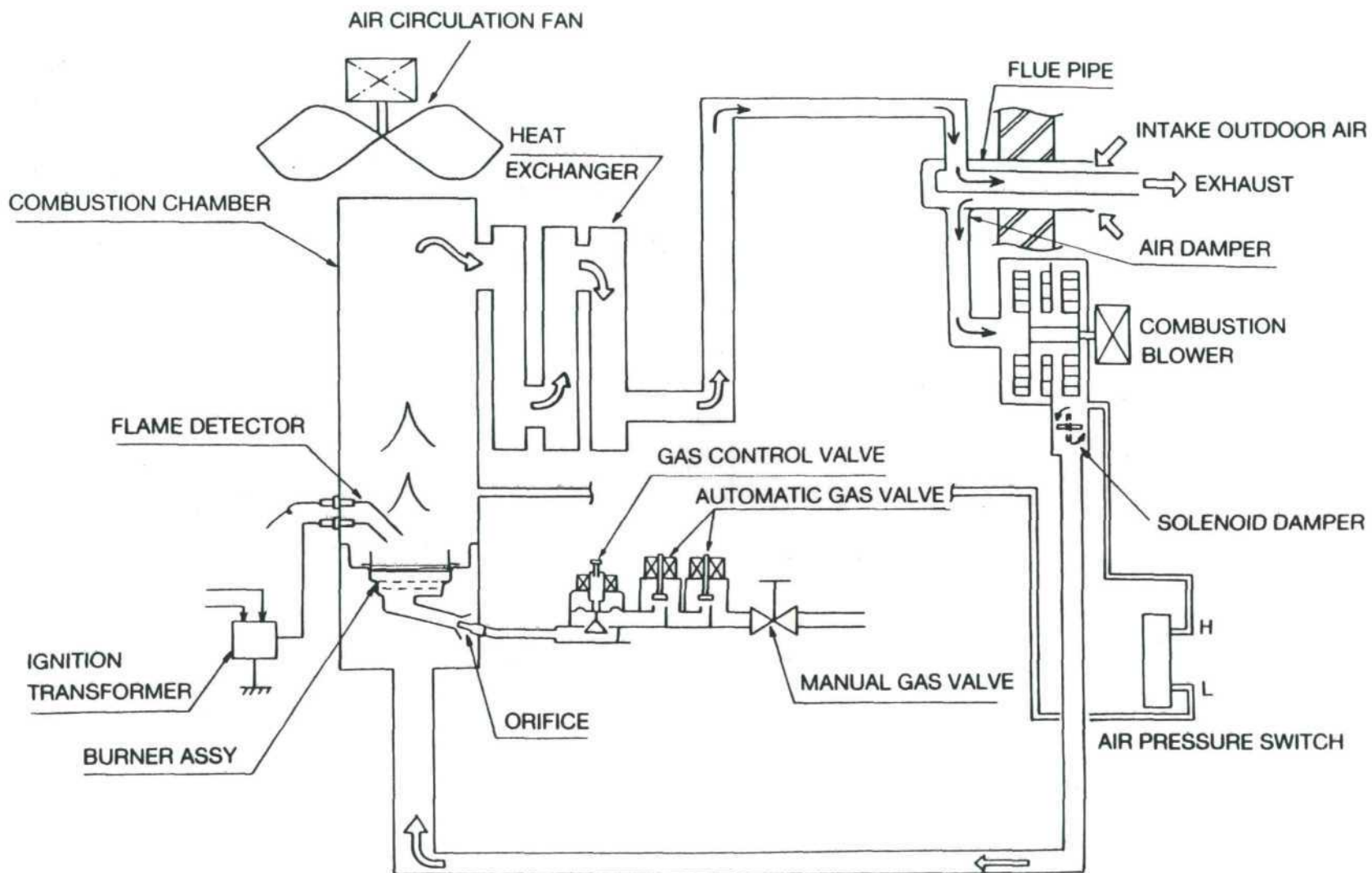


Figure 1-8 ELEMENTS OF COMBUSTION SYSTEM



# MONITOR HEATING SYSTEM

## Section 2: Installation

### 2-1 NOTICE BEFORE INSTALLATION

The heater must be installed by a qualified service person according to this installation instruction .

The installation must conform with local codes or, in the absence of local codes, the National fuel Gas Code, ANSI Z223.1 .

The installation must conform with local codes or, in the absence of local codes, the current CAN 1-B149 INSTALLATION CODE.

For mobile housing and recreational installation the current Standard CSA Z 240.4 GAS EQUIPPED RECREATIONAL VEHICLES AND MOBILE HOUSING.

A manufactured home (mobile home) installation must conform with the Manufactured Home Construction and Safety Standard, Title 24 CFR, Part 3280, or, when such a standard is not applicable, the Standard for Manufactured Home installations, ANSI A 225.1/NFPA 501A.

Due to high temperatures the appliance should be located out of traffic and away from furniture and draperies.

Children and adults should be alerted to the hazards of high surface temperatures and should stay away to avoid burns or clothing ignition.

Young children should be carefully supervised when they are in the same room as the appliance.

Clothing or other flammable material should not be placed on or near the appliance.

Make sure that the flow of combustion and ventilation air not be obstructed.

Any safety or guard removed for servicing an appliance must be replaced prior to operating the appliance.

#### WARNING

Do not operate appliance with the panel removed, cracked or broken. Replacement of the panel should be done by a licensed or qualified service person.

Installation and repair should be done by a qualified service person. The appliance should be inspected before use and at least annually by a qualified service person. More frequent cleaning may be required due to excessive lint from carpeting, bedding material, etc. It is imperative that control compartments, burners and circulating air passageways of the appliance be kept clean.

Do not use this heater if any part has been under water. Immediately call a qualified service technician to inspect the heater and to replace any part of the control system and any gas control which has been under water.

The appliance, when installed, must be electrically grounded in accordance with local codes or, in the absence of local codes, with the National Electrical Code, ANSI/NFPA 70 .

The appliance, when installed, must be electrically connected and grounded in accordance with local codes or, in the absence of local codes, with the current CSA C22.1 CANADIAN ELECTRICAL CODE.

#### WARNING

THIS APPLIANCE IS EQUIPPED WITH A THREE-PRONG (GROUNDING) PLUG FOR YOUR PROTECTION AGAINST SHOCK HAZARD AND SHOULD BE PLUGGED DIRECTLY INTO A PROPERLY GROUNDED THREE-PRONG RECEPTACLE. DO NOT CUT OR REMOVE THE GROUNDING PRONG FROM THIS PLUG.

#### WARNING

IN MANUFACTURED/MOBILE HOMES WIRED FOR 120/240V, ENSURE THAT THE GF500 IS ONLY PLUGGED INTO A 120 VOLT CIRCUIT.



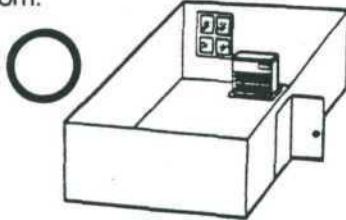
# MONITOR HEATING SYSTEM

## Section 2: Installation

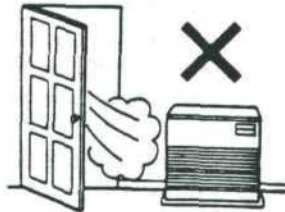
### 2-2 HEATER INSTALLATION

In choosing a location for the Heater, the following guidelines must be considered:

- Install the Heater where there are no obstacles in front of it and where it will most effectively warm the room.



- Do not install the Heater near a door or in drafty location.



- Install the Heater to permit easy access to the room's gas cock, and the power receptacle.
- Do not install near stairs or an emergency exit.
- Exhaust pipe must be kept clear of flammable materials.



- Keep Heater clean and do not store any flammable items on or near the Heater.



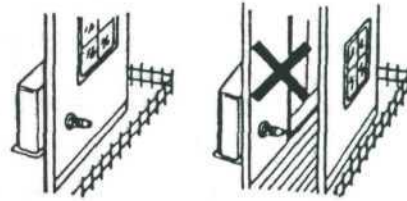
- This Heater is not designed to be built in.



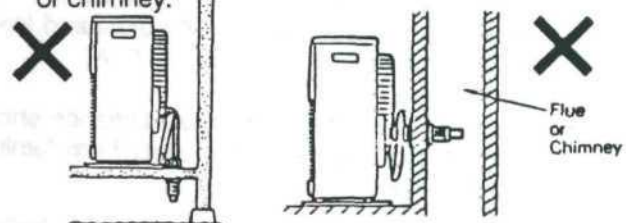
- Keep flammable materials, trees, shrubs etc. away from flue pipe.



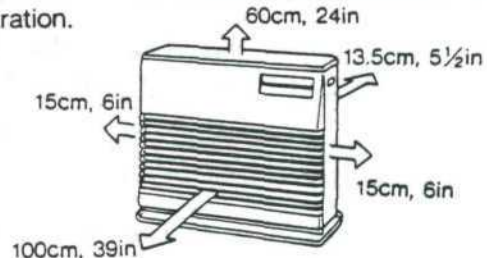
- Do not vent unit into other rooms. Flue pipe must be outside.



- Do not install nor exhaust the flue pipe into a crawl space or underneath floor nor into a flue or chimney.



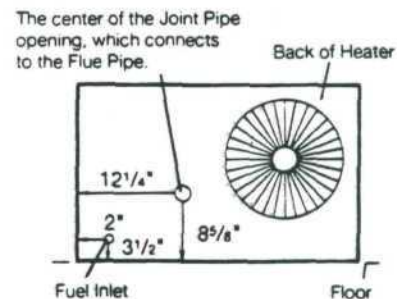
- The area around the heater should be free of obstacles that might interfere with the free flow of air. Allow the clearances shown in the illustration.



- The heater may be installed on combustible flooring on the metal tray provided.

**NOTE:** Use the cardboard template provided with the Heater for flue pipe location.

Just in case the template was misplaced, the approximate flue pipe hole location measurements are follows:



# MONITOR HEATING SYSTEM

## Section 2: Installation

### 2-3 FLUE PIPE CLEARANCES

- Vent terminal must be located at least 3 feet above any forced air inlet located within 10 feet.
- The vent terminal of a direct vent appliance with an input of 50,000 Btu per hour or less shall be located at least 9 inches from any opening through which flue gases could enter a building, and such an appliance with an input over 50,000 Btu per hour shall require a 12-inch vent termination clearance. The bottom of the vent terminal and the air intake shall be located at least 12 inches above grade.
- Flue pipe installations should provide for venting to a confined space through which there is a free flow of outdoor air. Clearances to adjacent walls or obstacles must comply with the requirements shown below.

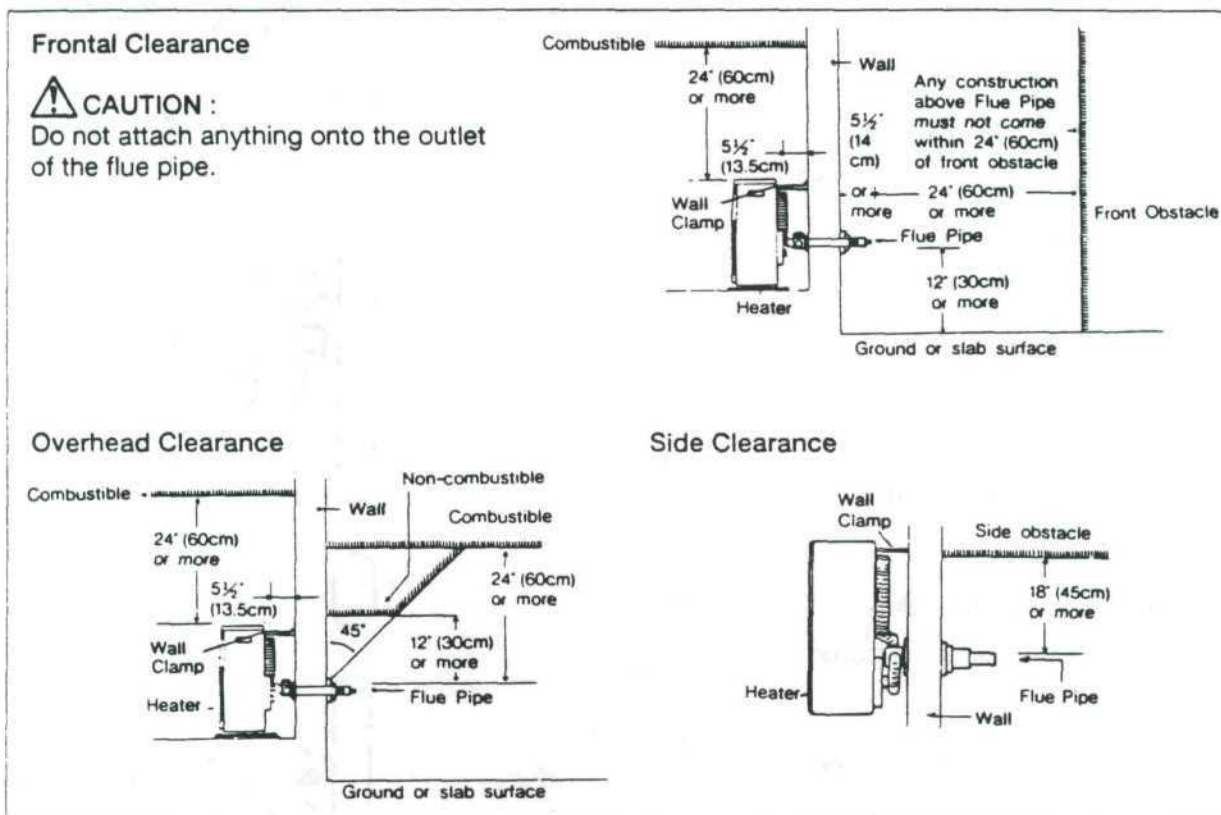


Figure 2-1

### IMPORTANT:

(1) In areas of heavy snow falls, ground surface clearance must be increased according to average snow falls, to prevent flue pipe from being buried.

(2) In open area with strong wind, a wind break may be necessary.

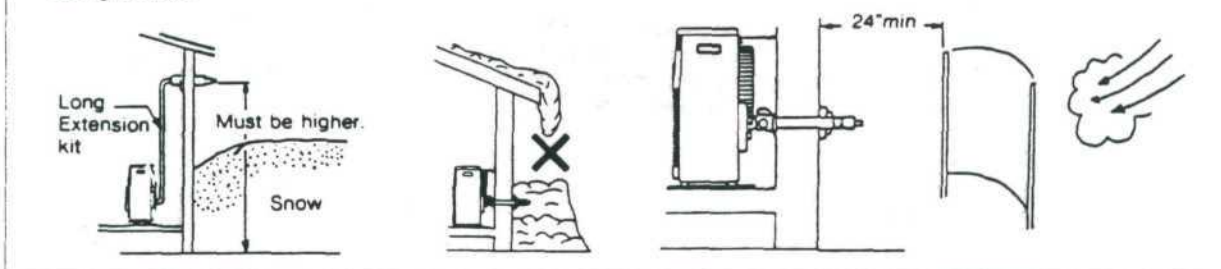


Figure 2-2

NOTE: Unit should not be vented through a window.



# MONITOR HEATING SYSTEM

## Section 2: Installation

### 2-4 INSTALLING AN EXTENSION KIT

Installing an Extension Kit requires the construction of an air line and the exhaust line. The air line is connected between the Air Supply Elbow at the rear of the heater and the air inlet port on the Flue Pipe. Similarly, the exhaust line is connected between the joint pipe at the rear of the heater, and the exhaust port on the Flue Pipe.

**IMPORTANT:** The PP air line is longer than the exhaust line and may need to be cut to size. Be sure, however, to thoroughly deburr all rough edges.

**NOTE:** 1 inch minimum clearance must be maintain to combustibles from exhaust piping.

REF. NO.	NAME OF PART
1	Exhaust Pipe Clamp
2	Exhaust Elbow
3	Adjustable Exhaust Pipe
4	Exhaust Joint
5	Air Extension Pipe
6	Pipe Joint
7	90° Joint
8	Support ( Base)
9	Support (Cover)
10	Leg
11	Joint Supporter
12	Heat Insulation Cover
13	Band
14	Self-Tapping Screws
15	Self-Tapping Screws
16	Machine Screws
17	Bond
18	Hose Clamp (this part comes with your Monitor Heater)
19	Air Damper (this part comes with your Monitor Heater)
20	Flue Pipe (this part comes with your Monitor Heater)
21	Long Wall Clamps

Connect air supply elbow here (air supply elbow is a component of your Monitor Heater; it is not included in this kit).

Use the long wall clamps in place of the wall clamps supplied with your Monitor Heater.

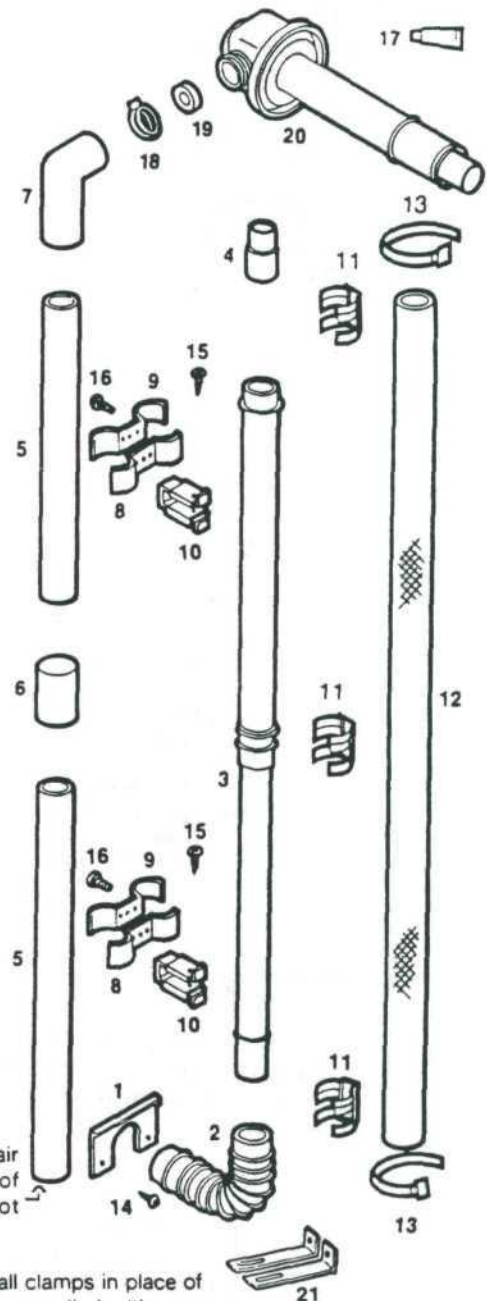


Figure 2-3

# MONITOR HEATING SYSTEM

## Section 2: Installation

Max lengths and bends allowable using extension kits.

Extension kits are available in four different lengths. For exact dimensions refer to the accessories catalog.

Exhaust portion of extension kit needs 1" minimum clearance to combustibles.

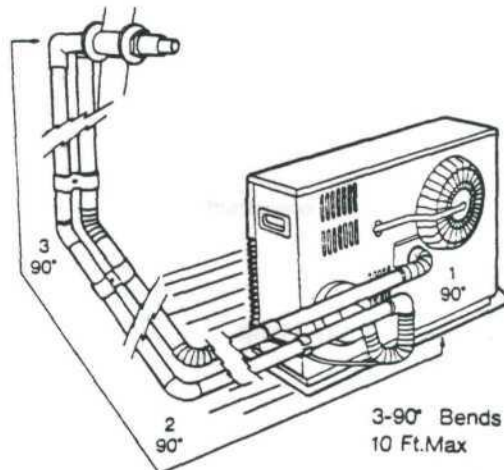
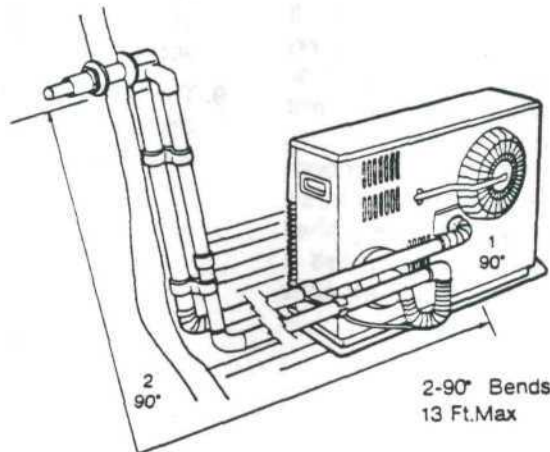
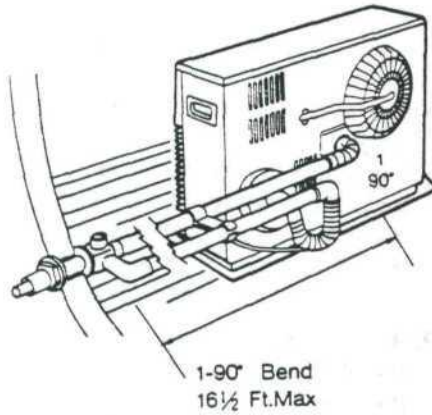


Figure 2-4 MAX LENGTHS AND BENDS ALLOWABLE USING EXTENSION KITS



# MONITOR HEATING SYSTEM

## Section 2: Installation

### 2-5 GAS CONNECTION

1. The gas supply line shall be gas-tight, sized and so installed as to provide a supply of gas sufficient to meet the maximum demand of the heater without loss of pressure.
2. A shut off valve should be installed in the upstream of the gas line to permit servicing.
3. Flexible pipe and any appliance connector valve used for gas piping shall be types approved by nationally recognized agencies.
4. Any compound used on the threaded joint of the gas piping shall be a type which resists the action of liquefied petroleum gas.
5. Supplied gas pressure must be within the limits shown in the specifications.
6. After completion of gas pipe connections, all joints including at the heater must be checked for gas-tightness by means of leak detector solution, soap and water, or an equivalent nonflammable solution, as applicable.  
CAUTION: Since some leak test solutions, including soap and water, may cause corrosion or stress cracking, the piping shall be rinsed with water after testing, unless it has been determined that the leak test solution is noncorrosive.
7. The appliance and its individual shut off valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressure in excess of 1/2 psig.  
The appliance must be isolated from the gas supply piping system by closing its individual manual shutoff valve during any pressure testing of the gas supply system at test pressure equal to or less than 1/2 psig.
8. A 1/8" test plug is provided for testing of manifold pressure see schematic for location (page 59)  
At time of installation installer must supply a 1/8" N.P.T. plugged tapping, accessible for test gauge connection, immediately upstream of the gas supply connection of the appliance.
9. The minimum and maximum inlet gas supply pressure are for the purpose of input adjustment.

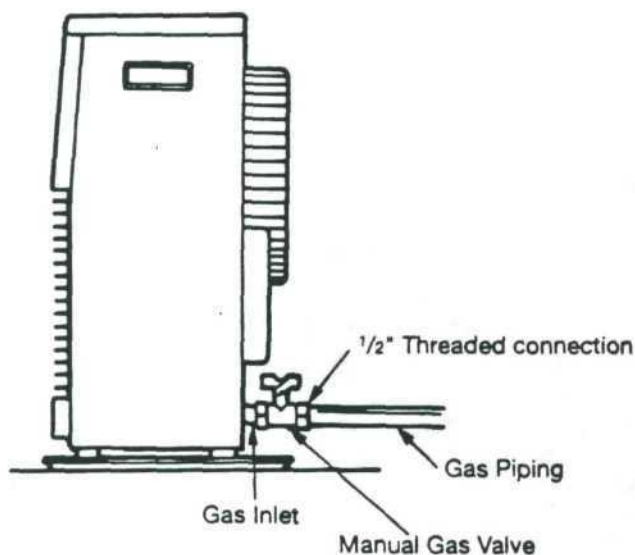


Figure 2-5

# MONITOR HEATING SYSTEM

## Section 2: Installation

### 2-6 GAS CONVERSION PROCEDURE

1. Replace the natural orifice with the LP orifice which is included in the conversion kit. Check orifice fitting for gas leak as per instruction page 14 #6.
2. Replace the air damper with that for LP which is included in the conversion kit.
3. Slide the gas type selector on PCB to the LP position.
4. Check that the manifold pressure matches the following values. If not adjust them to the following values using volume resistor (VR 1:Hi VR 2: Lo)on the PCB.

Hi: 3.4"  $\begin{smallmatrix} +0 \\ -0.25 \end{smallmatrix}$  W.C.

Lo: 1.14"  $\begin{smallmatrix} +0.16 \\ -0 \end{smallmatrix}$  W.C.

After check, reinstall fitting and check for leaks.

### 2-7 HIGH ALTITUDE INSTALLATION

All Units must be installed according to the following chart to determine which orifice will be used for the appropriate altitude.

#### NATURAL GAS

UP TO 2000 feet No changing orifice (3.50 mm)  
2000 - 6000 feet 3.35 mm drill size orifice

#### LP GAS

UP TO 2000 feet No changing orifice (2.64 mm)  
2000 - 6000 feet 2.53 mm drill size orifice



#### WARNING:

Do not use above 6000 feet.

### 2-8 MANIFOLD PRESSURE READINGS

Manifold pressure readings are based on the unit in a standard installation.

Use of extension kits will increase readings as follows.

Gas	Installation	Manifold Pressure W.C.	
		High burn	Low burn
Nat.	extension kits	3.50"	1.26"
	up to 20"		
	extension kits exceeding 20"	3.70"	1.30"
LP	extension kits	3.62"	1.26"
	up to 20"		
	extension kits exceeding 20"	3.82"	1.32"



# MONITOR HEATING SYSTEM

## Section 3: Operation

### 3-1 INTRODUCTION

Monitor is an easy-to-operate vented gas heater. Routine operation features high BTU output, automatic adjustment of room temperature, low power consumption, and choice of automatic or manual heater operation.

This section provides all information necessary to operate the Monitor Heating System. All operation procedures specified should be performed in the order in which they are described.

### 3-3 OPERATING CONTROLS AND INDICATORS

Several controls and indicators are used to operate the heater and to monitor its performance as follows:

### 3-2 OPERATING SPECIFICATIONS

The following specifications apply to the operation of the Monitor GF 500.

- Rated Efficiency: 81%
- Power Consumption: as follows
  - High Burn 80 watts, Low Burn 70 watts
- Circulation Fan Output: 388 cubic feet/min
- Potential Heating Area: 900 - 3200 sq. feet

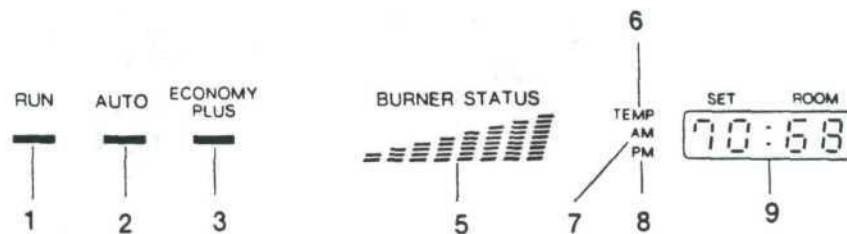


Figure 3-1, INDICATORS

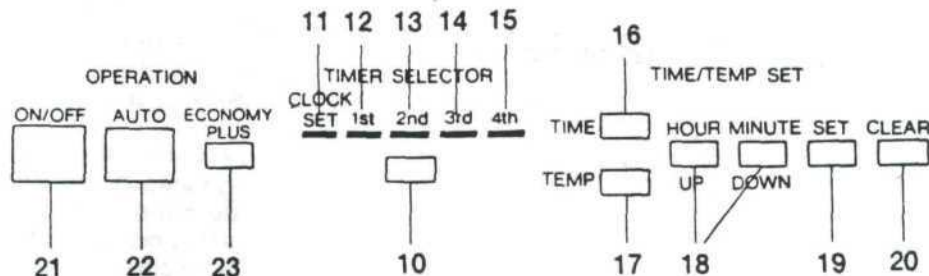


Figure 3-2, CONTROLS

FIGURE AND ITEM NO	CONTROL OR INDICATOR.	FUNCTION						
Figure 3-1, Item 1	RUN Indicator Light	Light to indicate that power has been applied to heater. Illuminates when operation ON/OFF push-button switch is pressed to position ON						
Figure 3-1, Item 2	AUTO Indicator Light	Lights when heater runs in automatic mode. AUTO, RUN, and appropriate BURNER STATUS Indicators are illuminated simultaneously if heater is burning.						
Figure 3-1, Item 3	ECONOMY PLUS Indicator Light	Lights when heater runs in Economy Plus mode.						
Figure 3-1, Item 5	BURNER STATUS Indicator Lights	Light in accordance with heat output as follows: <table><tr><td>Heat Output</td><td>Light Pattern</td></tr><tr><td>High</td><td>8 indicators-ON</td></tr><tr><td>Low</td><td>4 indicators-ON</td></tr></table>	Heat Output	Light Pattern	High	8 indicators-ON	Low	4 indicators-ON
Heat Output	Light Pattern							
High	8 indicators-ON							
Low	4 indicators-ON							

# MONITOR HEATING SYSTEM

## Section 3: Operation

FIGURE AND ITEM NO	CONTROL OR INDICATOR.	FUNCTION
Figure 3-1, Item 6	RUN Indicator Light	Lights when heater is running and Digital Window is showing the temperature.
Figure 3-1, Item 7	AM Indicator Light	
Figure 3-1, Item 8	PM Indicator Light	
Figure 3-1, Item 9	Digital Display	Indicates SET and ROOM temperature when heater is running, and indicates time when heater is Off. Indicates time and temperature for automatic operation setting.
Figure 3-2, Item 10	TIMER SELECTOR push-button switch	The automatic function allows the programming of different temperatures for different times of the day. Two, three or four settings can be used.
Figure 3-2, Item 11	CLOCK SET Indicator Light	Allows programming of current time when illuminated.  NOTE: Prior to programming current time, Digital Display shows 88:88. IMPORTANT: Once current time has been programmed, press the SET push-button switch within 60 seconds. Otherwise clock display will revert to previously programmed time, if any.
Figure 3-2, Item 12	1st Indicator Light	Allows programming of first automatic time and temperature selection when illuminated.  When programmed, heater automatically operates at specified time and temperature (i.e. 6:00 a.m., 70°F), if set for AUTO, providing that heater has been set for automatic mode of operation. TIME, TEMP, HOUR(UP), MINUTE(DOWN) and SET push-button switches are used to program first operated time and temperature. IMPORTANT: Once time and temperature have been programmed, the SET push-button switch must be pressed within 15 seconds. Otherwise, time and temperature will revert to previously programmed time, if any. When this Light illuminates, 1st presently programmed time and temperature displayed.
Figure 3-2, Item 13	2nd Indicator Light	Allows programming of second automatic time and temperature selection when illuminated.



# MONITOR HEATING SYSTEM

## Section 3: Operation

FIGURE AND ITEM NO	CONTROL OR INDICATOR.	FUNCTION
Figure 3-2, Item 14	3rd Indicator Light	Programs 3rd automatic heater operation as same as 1st Indicator Light.
Figure 3-2, Item 15	4th Indicator Light	Programs 4th automatic heater operation as same as 1st Indicator Light.
Figure 3-2, Item 16	TIME push-button switch	This switch is used to set time and change display over.
Figure 3-2, Item 17	TEMP push-button switch	This switch is used set temperature and change display over, in 2 degree increments.
Figure 3-2, Item 18	HOUR/UP, MINUTE/DOWN repetitive-action push-button switch	Programs time or temperature. <b>NOTE:</b> Each time push-button switch is pressed, the digit advances in increments of one digit, If push-button is pressed and held, the digits are advanced repetitively.
Figure 3-2, Item 19	SET push-button switch	"Sets" time and/or temperature. If this control is not pressed after time and/or temperature have been programmed, the time and/or temperature programmed (as indicated by display window) will not be accepted, and will revert to previously programmed time and/or temperature.
Figure 3-2, Item 20	CLEAR push-button switch	Erases any programmed time and temperature. When cleared, time and/or temperature previously programmed and displayed disappear(s) from window. <b>IMPORTANT:</b> Both current time and automatically programmed time(s), temperature(s) will have to be reprogrammed if electrical operation is interrupted by power failure or by disconnecting heater plug from wall outlet beyond 5 minutes. If this occurs, the heater will go into MANUAL mode of operation and maintain room temperature according to the setting temperature you've selected by using the slide selector for the reset temperature at the lower right hand side of the cabinet.
Figure 3-2, Item 21	ON/OFF push-button switch	ON position (push-button is "in") applies power to the unit. When this occurs, the RUN indicator lights to indicate that heater operation has begun. OFF position (push-button is "out") remove power from the heater. All circuits—except for Clock and Air Flow—are shut down.

# MONITOR HEATING SYSTEM

## Section 3: Operation

FIGURE AND ITEM NO	CONTROL OR INDICATOR.	FUNCTION
Figure 3-2, Item 22	AUTO push-button switch	Places heater in automatic mode of operation. AUTO indicator lights to confirm automatic operation. Assuming that the heater has been properly programmed and heater is in ON position, heater will operate automatically. When pressed again, AUTO indicator goes out and then heater will operate in MANUAL mode. During manual operation, the user turns heater ON and OFF, at will. When AUTO is disengaged, the unit will operate on a manual temperature determined by the AUTO setting for that time of day.
Figure 3-2, Item 23	ECONOMY PLUS push-button switch	Places heater in Economy Plus mode of operation. ECONOMY PLUS indicator lights to confirm Economy Plus operation. When pressed again, ECONOMY PLUS indicator goes out and then Economy Plus mode will be cancelled. NOTE: Economy Plus mode is accepted only in the MANUAL mode.

### 3-4 PRE-OPERATION CHECK LIST

After heater installation, but prior to Monitor heater start-up, inspect the system for operational readiness. The following check list specifies those items that should be inspected on a routine basis:

- ✓ Check that the Monitor heater is plugged into wall outlet (120 VAC, 60 HZ).
- ✓ Ensure the gas type is correct for the Monitor heater.
- ✓ Inspect Gas Line for signs of leaks, loose connection or cracks.
- ✓ Confirm that Gas Valves in the room and Manual Gas Valve are open so gas can flow freely.
- ✓ Outside dwelling, check area immediately around Flue Pipe for combustibles or obstructions to free air circulation.
- ✓ Inspect Air Line for cracks, loose connections or blockage.
- ✓ Check Exhaust Line for cracks, loose connections or blockage.
- ✓ At rear of heater, verify that air flow to the Air Circulation Fan is not blocked.

- ✓ Inspect dwelling interior and confirm that immediate area near heater is free of combustible and objects that might interfere with free air flow.
- ✓ Make certain that Heat Sensor is not exposed to drafts, direct sunlight, nor direct heat from the Monitor

If this inspection reveals any system deficiencies, correct the problems before operating the heater.

### 3-5 OPERATION

Operation of Monitor heater can be controlled manually by the user, or run automatically by the microprocessor.

Paragraphs 3-6 through 3-10 provide the details of heater start-up, operation, and shutdown. The controls and indicators illustrated by Figure 3-1 and 3-2 are used to operate the system and to monitor the heater's performance.



# MONITOR HEATING SYSTEM

## Section 3: Operation

### 3-6 MANUAL HEATER OPERATION

Operation of the heater is under the direct control of the user (heater will not operate automatically). The heater will, however, automatically respond to changes in room temperature signaled by the Heat Sensor to maintain the temperature of the room at a comfortable level.

#### STEP1: Prime the Heater

Turn manual gas valve at rear of the heater to the full ON position.

#### STEP2: Select Manual Operation

If heater operation is in AUTO mode, press the AUTO push-button switch and change Auto to Manual mode.

#### STEP3: Select Temperature Setting

Press the TEMP push-button switch and press either the UP or DOWN push-button switch to set the digital set room temperature indicator to the desired temperature, and then press the SET push-button switch.

**IMPORTANT:** In case no temperature is set, temperature will automatically be set at the setting temperature selected by using the slide selector for the reset temperature.

#### STEP4: Turn Monitor On

Press the ON/OFF push-button switch to position ON. The RUN indicator light illuminates to indicate that power has been applied to the instrument and the heater is cycled for manual mode of operation.

### INSTRUCTIONS FOR ECONOMY PLUS MODE

To engage the economy plus mode, simply press down the button labeled "Economy Plus", to disengage press again.

**NOTE:** Operation switch must be "ON" and in MANUAL mode.

This feature minimizes the "ON" and "OFF" cycling of the unit by allowing it to overshoot the set temperature by 12 degrees instead of the normal 4 degrees.

The advantages of this feature are to increase the overall efficiency of the unit by:

1. Decreasing electrical consumption by decreasing the frequency of ignition cycles.
2. Reducing heat loss during the prepurge and postpurge cycles.
3. Reducing inefficient combustion associated with start up and shut down.
4. Prolonging component life by decreasing expansion and contraction of internal parts.

**NOTE:** This feature could be compared to driving an automobile in stop and go traffic (regular mode) versus highway driving with cruise control engaged (Economy Plus mode).

### 3-7 AUTOMATIC HEATER OPERATION

Automatic operation is established by programming the time/temperature settings for specific times. On a daily basis, a maximum of four time/temperature settings can be programmed. If, subsequently, it should be desired to switch to manual mode of operation, the changeover can be made at any time.

Proceed with automatic mode of operation in the following manner:

#### STEP 1: Program Clock for Current Time

- A. Press the TIMER SELECTOR push-button switch, at which time the CLOCK SET Indicator light will illuminate.
- B. Press HOUR push-button switch to program current hour on the Clock.

**IMPORTANT:** Be sure to set clock for AM or PM, as appropriate.

**NOTE:** Both hour and minute digits on Display Window are advanced in increments of one by pressing the appropriate push-button switch one time for each digit; digits can also be advanced repetitively by pressing and holding the appropriate push-button switch.

- C. Press MINUTE push-button switch to program the current minute(s) on Clock.
- D. Immediately after programming current time in terms of hours and minutes, press the SET push-button switch.

#### STEP2: Program the 1st Time/Temperature

- A. Pressing the TIMER SELECTOR push-button switch will illuminate the 1st indicator light.
- B. Press TIME push-button switch.



# MONITOR HEATING SYSTEM

## Section 3: Operation

- C. Press HOUR and MINUTE push-button switches to program 1st desired time.

**IMPORTANT:** Be sure to set the clock AM or PM, as appropriate.

- D. Immediately after programming the 1st desired time, press the SET push-button switch. This step must be completed within fifteen seconds after programming the time.
- E. Press TEMP push-button switch.
- F. Press UP and/or DOWN push-button switch(es) to program 1st desired temperature.
- G. Immediately after programming the 1st desired temperature, Press the SET push-button switch. This step must be completed within fifteen seconds after programming the temperature.

### STEP3: Program the Remaining Times

By pressing the TIMER SELECTOR push-button switch again, the 2nd Indicator Light will illuminate, at which time the 2nd setting can be programmed. Press again to set 3rd and again to set 4th.

**IMPORTANT:** The SET push-button switch must be pressed after each setting to lock into memory. Should heater power be interrupted by a power failure or by disconnection of the power cord beyond 5 minutes, heater reverts to MANUAL operation, and all AUTO programming is erased.

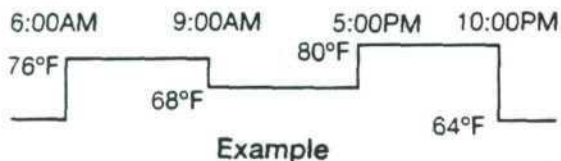
### STEP4: Select Automatic Operation

Press AUTO push-button switch. The AUTO indicator light will illuminate.

### STEP5: Turn Monitor ON

Press ON/OFF push-button switch to position ON. The RUN indicator light will illuminate to indicate that power has been applied to the heater.

From this point, heater operation is as follow example:



### 3-8 REPROGRAMMING THE MONITOR HEATER

On occasion, it may be necessary to reprogram the Monitor.

Reprogramming is performed as specified below:

### STEP1: Reprogramming Current Time (if necessary)

- A. Press the TIMER SELECTOR push-button switch to illuminate the CLOCK SET indicator light.
- B. Press HOUR and MINUTE push-button switches to program new current time. Set applicable time by watching Clock display.
- C. Press SET push-button switch.

**IMPORTANT:** If SET push-button switch is not pressed, current time will revert to previously programmed time.

### STEP2: Reprogramming Automatic Operation

- A. Press the TIMER SELECTOR push-button switch to illuminate the appropriate indicator light. (1st, 2nd, 3rd, or 4th)
- B. Press TIME push-button switch.
- C. Press CLEAR push-button switch. Time displayed on window will disappear.
- D. Using HOUR and MINUTE push-button switches program new desired time by watching the Display Window.
- E. Press SET push-button switch.
- F. Press TEMP push-button switch.
- G. Press CLEAR push-button switch. Set Temperature displayed on Window will disappear.
- H. Using UP and DOWN push-button switches program new desired temperature by watching the Display Window.
- I. Press SET push-button switch.

### 3-9 HEAT SENSOR

Heat Sensor is located on the rear of the cabinet. It is recommended to leave the sensor in its original mounted position. However should relocation be necessary, choose a location for the sensor that is not in the path of direct sunlight, drafts or the flow of warm air from the heater. Loosen the screw and release the sensor from the rear of the cabinet. Fasten the sensor to the wall with the screw.

### 3-10 MONITOR SHUTDOWN

A simple one-step procedure is utilized to shutdown the Monitor:

Press ON/OFF push-button switch to position OFF; the RUN indicator will extinguish.

**IMPORTANT:** Once heater has shut down, it cannot be restarted until post-purge cycle has been completed. If ON/OFF switch is left in position ON, Monitor operation will automatically restart upon completion of post-purge.



# MONITOR HEATING SYSTEM

## Section 3: Operation

### 3-11 RECOVERY FROM A POWER FAILURE

For the power interruption of up to 5 minutes, the set memory is kept and will resume operation auto-matically with the set memory.

For power interruptions beyond 5 minutes, heater will resume operation (after a 3 minutes cool down period) in the MANUAL mode and maintain room temperature according to the setting temperature selected by using the SLIDE SELECTOR for the reset temperature at the lower right hand side of the Cabinet.

When the TIME push-button switch is pressed or the TIMER SELECTOR push-button switch is pressed to illuminate the CLOCK SET indicator light, the Display Window will show 88:88 indicating the need to reset the clock and re-program the heater for automatic operation.

**REMARK:** In order to display reset temperature, it should be set before the heater is plugged in and energized.

New reset temperature selected after plugged in will take effect only after a power loss.

### 3-12 RECOVERY FROM OVERHEAT CONDITION

The Monitor is protected against damage resulting from an overheat condition by 115 °C (239 °F) automatic reset thermostat.

In the event of an overheat the thermostat is triggered to cut off the flow of gas to the Burner, the flame is extinguished automatically, and user is alerted to the overheat condition by blinking of the Burner Status indicators.

To recover from an overheat condition, proceed as outlined below:

**STEP1:** Turn OFF Heater

**STEP2:** Allow Monitor Heater to cool

**NOTE:** Be sure that heater is cool to touch.

A period of 30 to 45-minutes should be sufficient to permit heater to cool completely.

**STEP3:** Unplug Heater

Disconnect heater power cord from wall outlet.

**STEP4:** Check for Cause of Overheating

**NOTE:** Overheating is usually caused by objects that impede free air circulation.

Look for debris and other obstructions at front of heater, at Circulation Fan at rear of the heater, and at Flue Pipe tip outside dwelling.

**STEP5:** Remove Louver Assembly

**STEP6:** Clean Heater interior

### WARNING:

**BEFORE PROCEEDING TO CLEAN HEATER, BE SURE THAT HEATER INTERIOR IS COOL ENOUGH TO TOUCH.**

With a clean, lint-free, damp rag or other appropriate cleaning material, wipe up all dust, dirt and debris from exterior of cabinet, including exterior of Combustion Chamber and Heat Exchanger.

There is also a secondary thermal fuse set at 145°C (293 °F). If this opens it must be replaced.

**STEP7:** Replace Louver Assembly

**STEP8:** Reconnect Monitor Heater Power Plug to the Wall Outlet.

**STEP9:** Turn Heater ON

**STEP10:** Reprogram Heater Microprocessor

**STEP11:** Select Mode of Operation

**CAUTION:** If after the completion of recovery procedure, the heater overheats again, something is wrong!

Do not operate heater until problem has been diagnosed and corrected.

### 3-13 RECOVERY FROM BLOWN FUSE

All electrical components of the Monitor heater are protected against power overloads and electrical malfunctions by a 2-amp fuse. Should fuse blow, the recovery procedure is outlined below:

**STEP1:** Turn Monitor OFF

**STEP2:** Unplug heater

**STEP3:** Remove louver assembly

**STEP4:** Remove front cover

**NOTE:** As the Front Cover of the heater is connected to the Printed Circuit Board by Lead Wires, pull the Front Cover to the front side slightly and remove the Connector of the Lead Wires from the Printed Circuit Board, and then, remove the Front Cover.

**STEP5:** Locate and replace fuse

**STEP6:** Reattach front cover

(Be sure that the connector is connected to the printed circuit board.)

**STEP7:** Reattach louver assembly

**STEP8:** Plug heater power cord into wall outlet

**STEP9:** Turn Monitor ON

**STEP10:** Reprogram heater

**STEP11:** Program Automatic operation cycles (If applicable)

**STEP12:** Select Automatic operation (If applicable)







# MONITOR HEATING SYSTEM

## Section 4: Maintenance / Servicing

### 4-1 CLEANING THE CABINET

When the cabinet is soiled, wipe it with a damp cloth. Restore the shine with a dry cloth. The use of abrasive household cleaners may dull the finish.

### 4-2 CHECKING THE FLUE PIPE

At the beginning of each heating season, check the inside of the flue pipe. Foreign matter, spider webs, etc. must be removed.

Be sure all fittings and joints are tight.

**NOTE:** Make sure that all exhaust pipe and intake pipe connections are firmly mated.

Make sure that the connections between the flue pipe and exhaust/air intake pipe and hose are secured by the pipe holder (P/N 4006) and the hose band (P/N 4008).

### 4-3 CLEANING THE INTERIOR

Remove the louver, and vacuum and wipe away dust or other accumulation.

### 4-4 CLEANING THE BLOWER GUARD

Heating efficiency will be reduced if the blower guard at rear of the cabinet is blocked with dirt or dust.

Blockage also produces a rise in heat that could cause the heater to shut off.

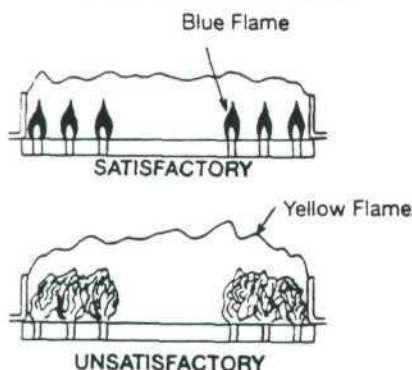
Wipe the guard clean at least once a week.

### 4-5 ELECTRIC MOTOR MAINTENANCE

Motors are permanently lubricated and need no lubrication. Keep fan and motor free of dust and dirt clean annually.

### 4-6 CHECKING THE BURNER FLAME

The burner of this appliance does not need cleaning, but check the burner flame once a year. Flame pattern should be as shown in the following figures. The burner must flame evenly over the entire surface when operating correctly. The flame must burn with a clear blue stable flame.



### 4-7 CLEANING THE BURNER

Under normal running conditions, soot will not deposit in great quantities at the burner, and a light covering of soot will not affect the performance of the unit thus it need not be cleaned. However, if heavy soot built up does occur the unit should be opened and cleaned.

If heavy soot builds up in a short period of time also check the air flows are normal, refer to page 5.

The burner is assembled using gaskets to maintain its air tightness. If these gaskets leak, the extra air can cause a serious soot problem and or exhaust gases to escape into the area being heated.

**NOTE:** If any gaskets are torn when components are removed, replace.

Cleaning the burner requires disassemble of the combustion chamber with the heat exchanger.

If cleaning is necessary, use the following method:

- A. Remove louver assembly.
- B. Remove front cover and wire connectors.
- C. Remove top cover.
- D. Remove heat shield that covers combustion chamber and its lead connectors. Remove pressure detective pipe.
- E. Remove screw at top of burner cap which attached it to cabinet. Remove screw at back of cabinet and joint pipe from exhaust duct and remove the 6 screws holding combustion chamber to burner chamber. Leave burner chamber assy attached to base.
- F. Remove combustion chamber and heat exchanger, as one assembly from unit.
- G. If soot is present at the burner, remove the soot by using wire brush, then clean the area by using a vacuum cleaner etc.  
It may also be necessary to clean the flame holder and burner port assy.

**NOTE:** Make sure all air holes are clear.

- H. Use wire brush to clean inside of combustion chamber. Vacuum and wipe clean with a waste cloth.  
Before reassembly inspect flame holder, if warped or distorted replace it.

# MONITOR HEATING SYSTEM

## Section 4: Maintenance / Servicing

---

I. Reassembly by reversing the procedure followed during disassembly.

**⚠ WARNING:**

Do not attempt to disassemble the heat exchanger and combustion chamber. This work is critical and must be done only by an authorized technician.

The disassembly of heat exchanger and combustion chamber is critical work and must be done only an authorized technician.

If any screws are torn or striped, they must be replaced.

# MONITOR HEATING SYSTEM

## Section 5: Troubleshooting

### GF500 Resistance Values

COMPONENT	APPROX. OHMS
Ignition Transformer (connector E/E)	108,000
Power Transformer (1)-Primary (AC 120V)	66
Power Transformer (1)-Secondary ( AC 11V)	1.6
Power Transformer (1)-Secondary (AC 120V)	647
Power Transformer (2)-Primary (AC 120V)	66
Power Transformer (2)-Secondary (AC 22V)	6.4
Damper Solenoid (connector I/I)	4,600
Resistor (connector G/G)	91
Circulation Fan (WH & BK)	115
Circulation Fan (BK & BL)	258.5
Combustion Blower (WH & GR)	78
Combustion Blower (GR & OR)	92
Thermistor (connector Q/Q at 77°F)	10,000
Fuse 2A (read with fuse out)	0.1
Gas Control Valve (connector P/P)	87
Gas Solenoid Valve (connector L/L)	2,400
Gas Solenoid Valve (connector M/M)	2,400

**WARNING:**

DISCONNECT HEATER FROM POWER SOURCE  
BEFORE MAKING ANY RESISTANCE TESTS.



# MONITOR HEATING SYSTEM

## Section 5: Troubleshooting

### GF 500 Component Voltage Readings

COMPONENT	READING TAKEN AT	AC	DC
Thermistor	Q on PCB Sensor Disconnected		5
All readings taken with components connected to PCB.			
Thermistor	Q on PCB Sensor connected		1.5 ~ 3.2
Air Pressure Switch/ Overheat Protector Closed	J on PCB	0	
Air Pressure Switch/ Overheat Protector Open	J on PCB	110	
Damper Solenoid	I on PCB		105
Gas Control Valve High mode	P on PCB		8.7
Gas Control Valve Low mode	P on PCB		6.2
Circulation Fan High Speed	WH to BK	110	
Circulation Fan Low Speed	WH to BK	91	
Ignition Transformer	E on PCB	110	
Power Transformer (1) (primary side)	AC 120V	110	
Power Transformer (1) (secondary side)	AC 11V AC 120V	11 120	
Power Transformer (2) (primary side)	AC 120V	110	
Power Transformer (2) (secondary side)	AC 22V	22	
Combustion Blower High Speed	F on PCB	110	
Combustion Blower Low Speed	F on PCB (Q1 is off)	88	
Resistor	G on PCB	22	
Gas Solenoid Valve	L on PCB		105
Gas Solenoid Valve	M on PCB		105

# MONITOR HEATING SYSTEM

## Section 5: Troubleshooting

### TEST POINT VOLTAGE

All readings take from EPOV.

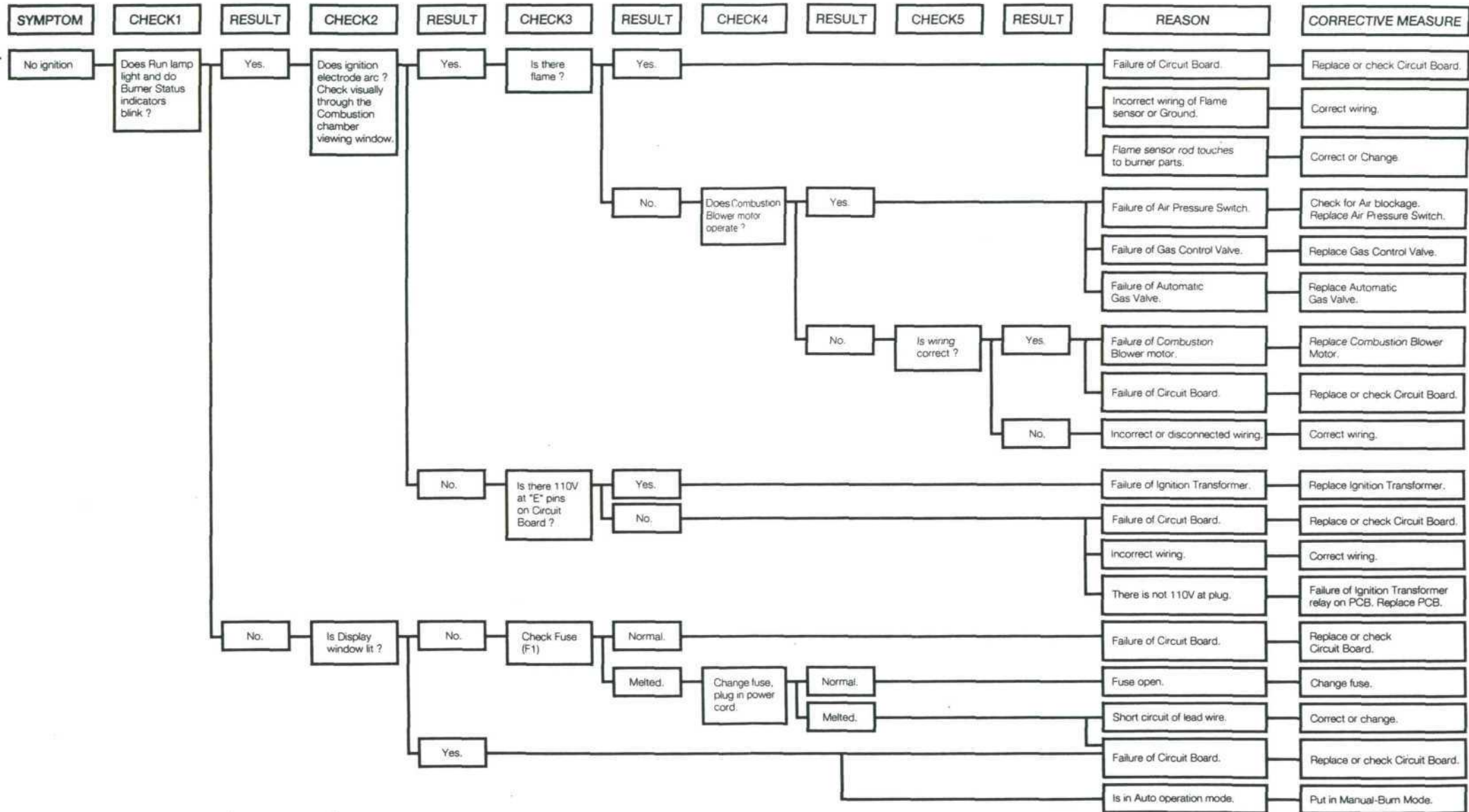
Operation Mode Test Point	Preparation	Pre-purge	Igniting	Pre-combustion
TP1	27V $\pm$ 50 %	27V $\pm$ 50%	27V $\pm$ 50 %	27V $\pm$ 50%
TP2	12V $\pm$ 30 %	12V $\pm$ 30%	12V $\pm$ 30 %	12V $\pm$ 30%
TP3	5V $\pm$ 10 %	5V $\pm$ 10%	5V $\pm$ 10 %	5V $\pm$ 10%
TP4	0.1V max.	0.1V max.	infinitely variable	1.2V min.
TP5	pulse	pulse	pulse	pulse
TP6	pulse at plug in	5V $\pm$ 10%	5V $\pm$ 10 %	5V $\pm$ 10 %
TP7	0.1V max.	0.1V max.	0.4 ~ 1.1V	0.4 ~ 1.1V
TP8	1.5 ~ 3.2V	1.5 ~ 3.2V	1.5 ~ 3.2V	1.5 ~ 3.2V

Operation Mode Test Point	High	Low	Off	Post-purge
TP1	27V $\pm$ 50 %	27V $\pm$ 50%	27V $\pm$ 50 %	27V $\pm$ 50%
TP2	12V $\pm$ 30 %	12V $\pm$ 30%	12V $\pm$ 30 %	12V $\pm$ 30%
TP3	5V $\pm$ 10 %	5V $\pm$ 10%	5V $\pm$ 10 %	5V $\pm$ 10%
TP4	1.2V min.	1.2V min.	0.1V max.	0.1V max.
TP5	pulse	pulse	pulse	pulse
TP6	5V $\pm$ 10 %	5V $\pm$ 10%	5V $\pm$ 10 %	5V $\pm$ 10%
TP7	0.7~ 1.3V	0.3 ~ 1.0V	0.1V max.	0.1V max.
TP8	1.5 ~ 3.2V	1.5 ~ 3.2V	1.5 ~ 3.2V	1.5 ~ 3.2V

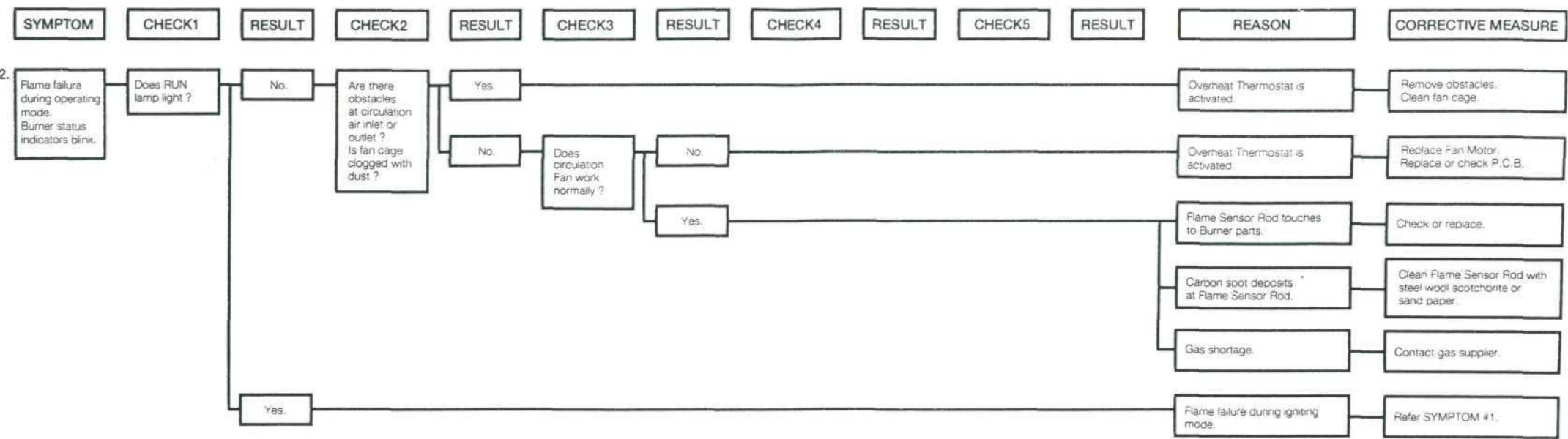
Abnormal readings of TP1 and TP2 can be caused by either failure of a transformer or PCB.  
Abnormal readings of TP3-TP8 caused by failure of PCB.

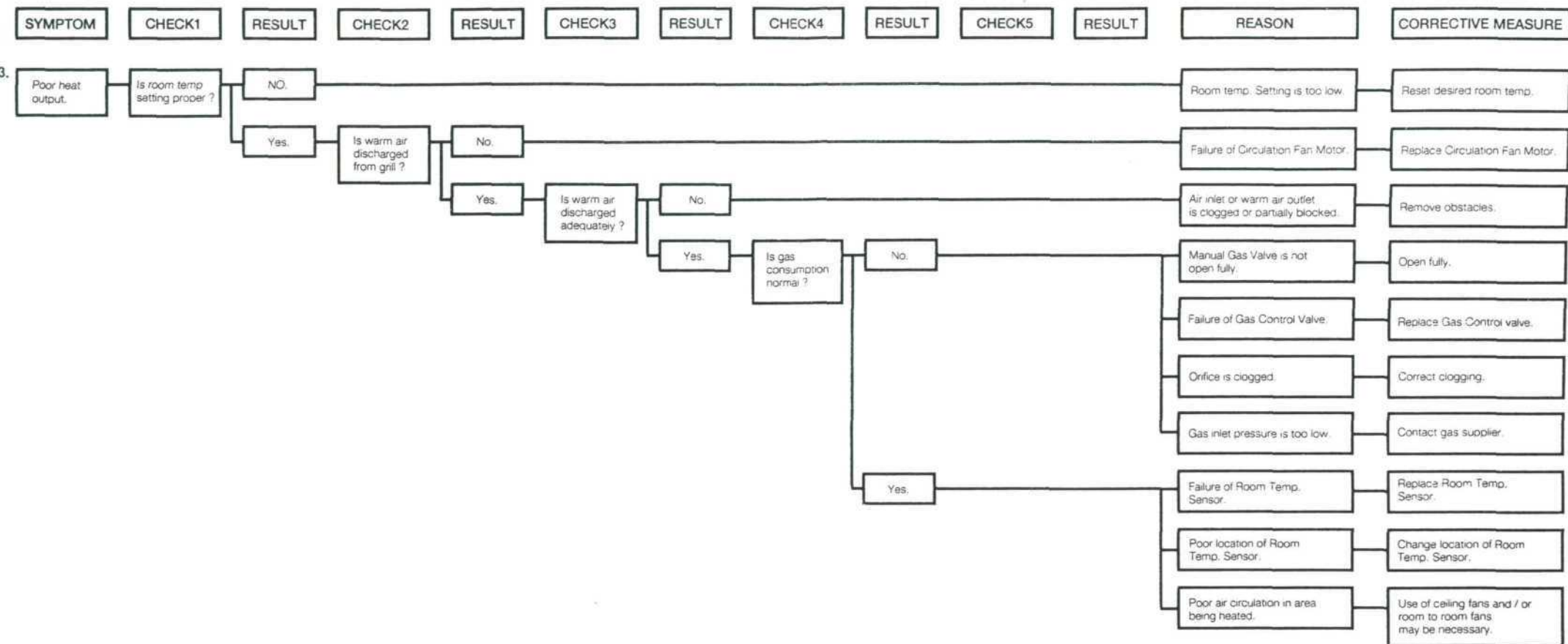
# GENERAL CHECKS

Is power available in wall outlet ?  
Is power Plug inserted in wall outlet ?  
Has there been a power interruption ? (Display window shows 88:88)  
Has Circulation Fan stopped ?  
Is Manual Gas Valve "open" ?  
Is Operation Switch on?  
Is operation mode on Manual ?  
Is set temperature higher than room temperature?

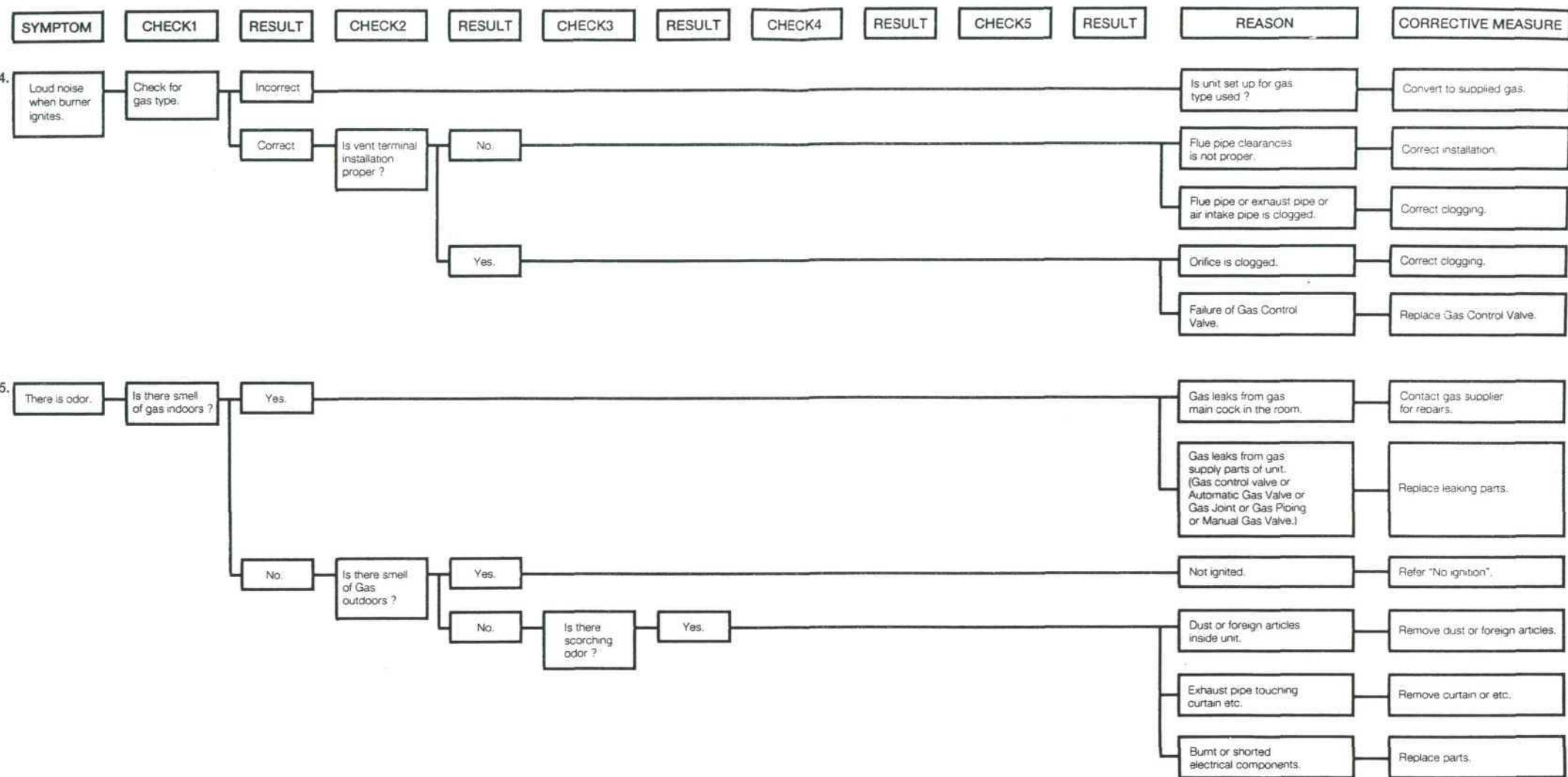


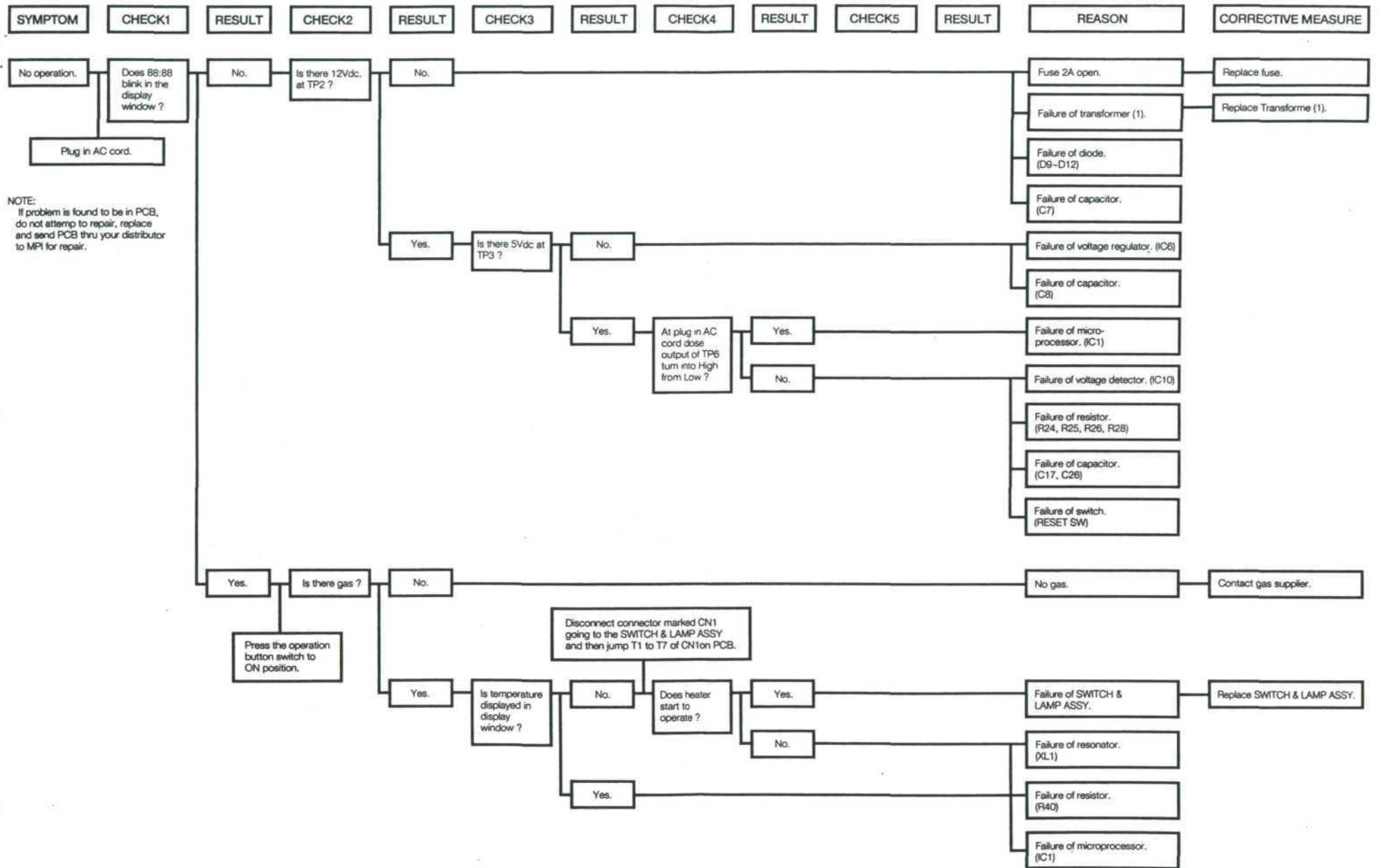




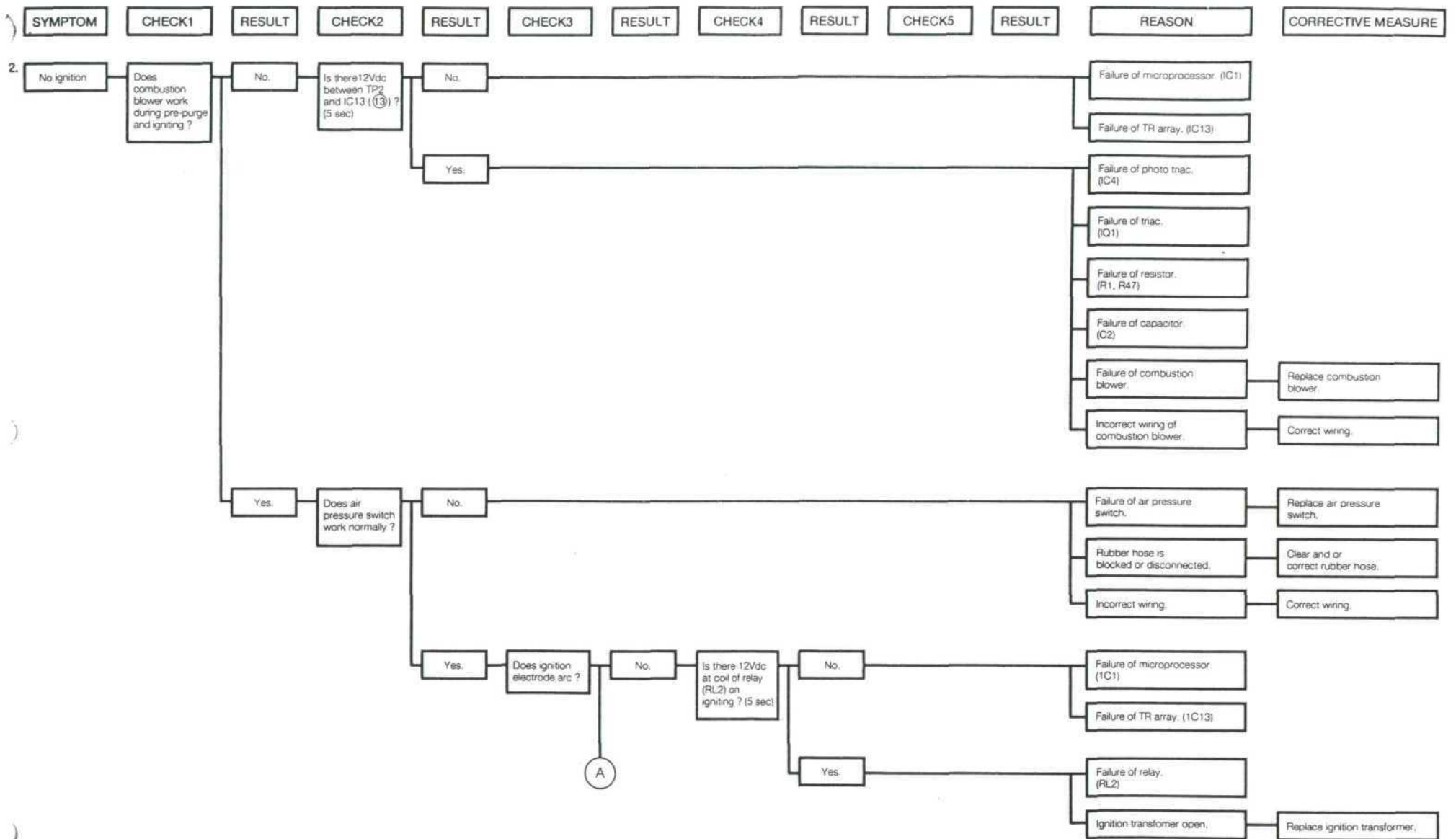








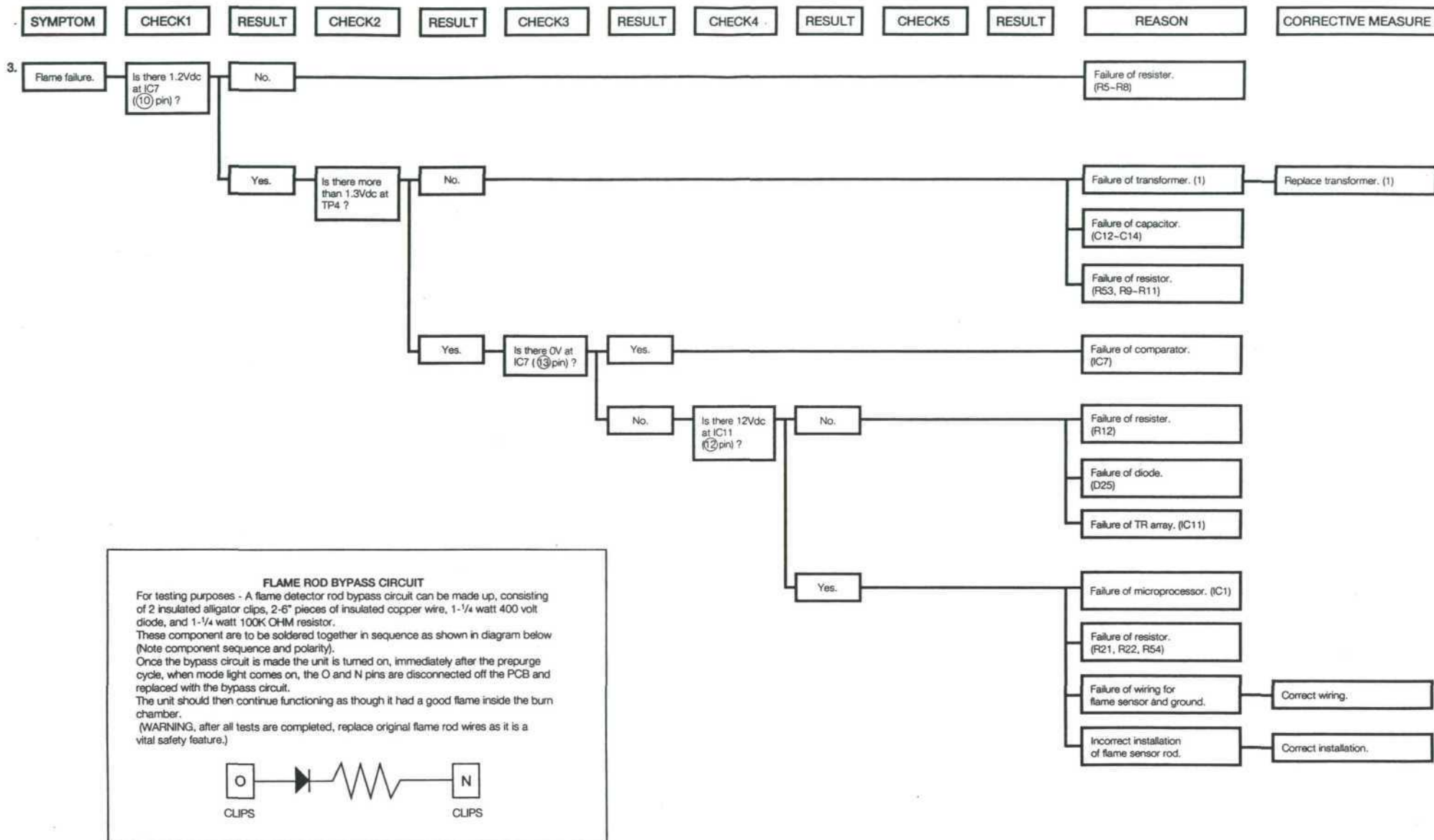


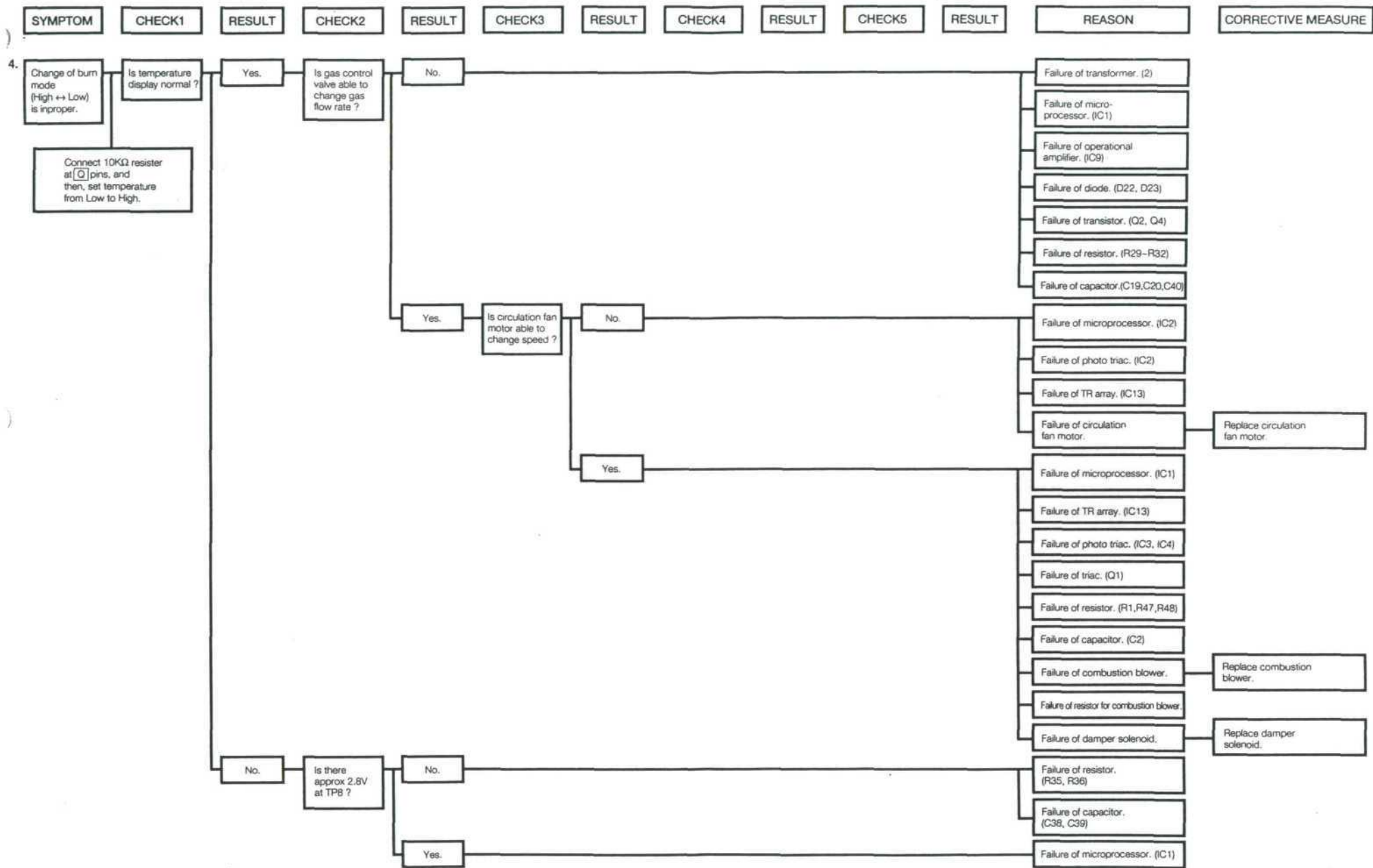


SYMPTOM	CHECK1	RESULT	CHECK2	RESULT	CHECK3	RESULT	CHECK4	RESULT	CHECK5	RESULT	REASON	CORRECTIVE MEASURE
---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------------------





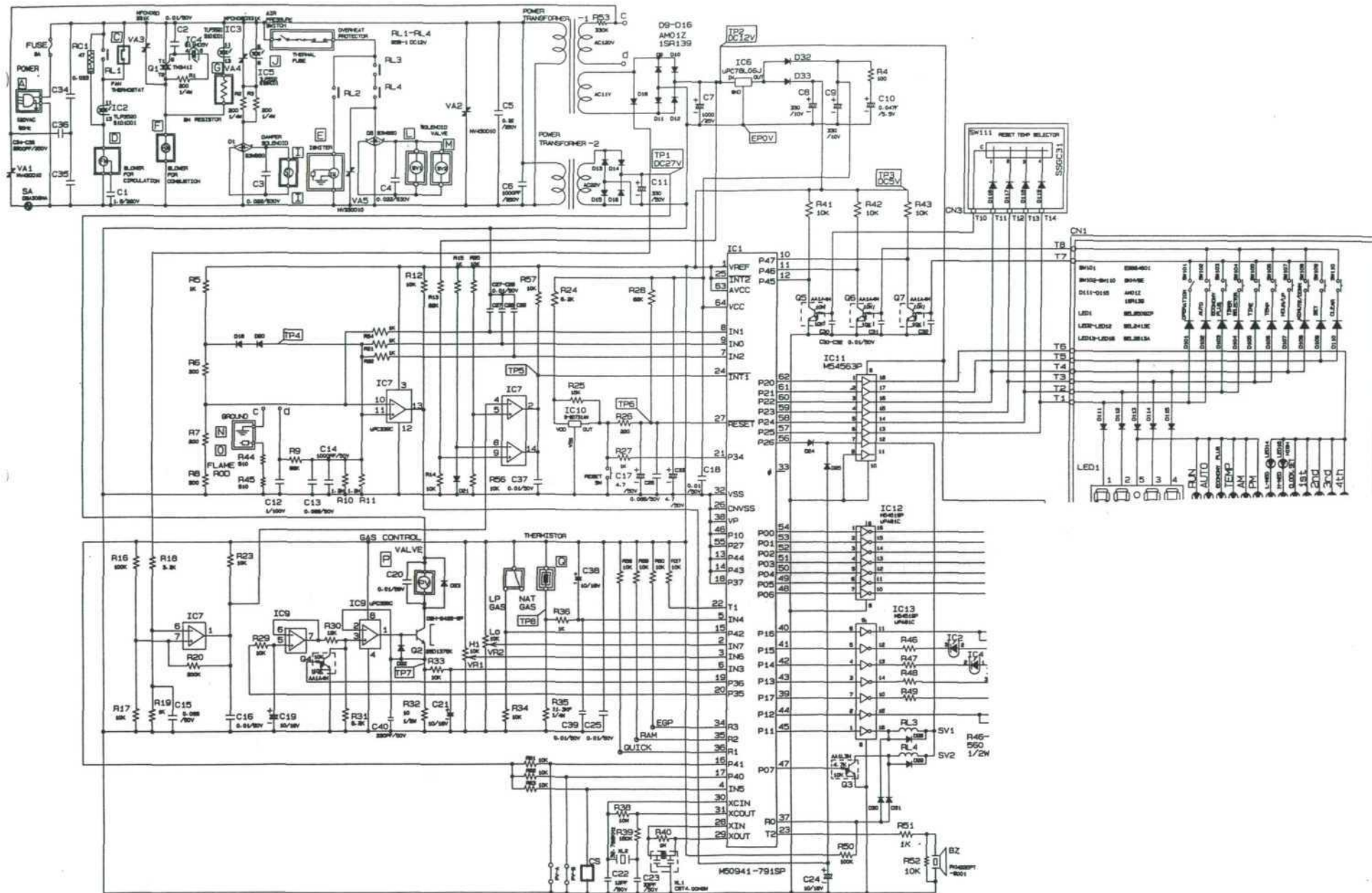






## INDICATION OF FAILURE MODE

Digital Display	The Reason of Indication	Trouble Point
E 01	At pre-purge, Flame rod is sensing flame when there should be none.	Flame sensing circuit, grounded flame rod or pinched wire.
E 05	After power on, power supply to the microprocessor timing circuit is incorrect.	Timer clock circuit bad or power source to unit above or below acceptable levels.
E 06	At starting of operation, the circuit to drive relay of Gas Solenoid Valve is malfunctioning.	Gas Solenoid Valve control circuit has a malfunction.
E 14	At starting of operation, circuit is malfunctioning.	Gas Control Valve circuit on PCB.

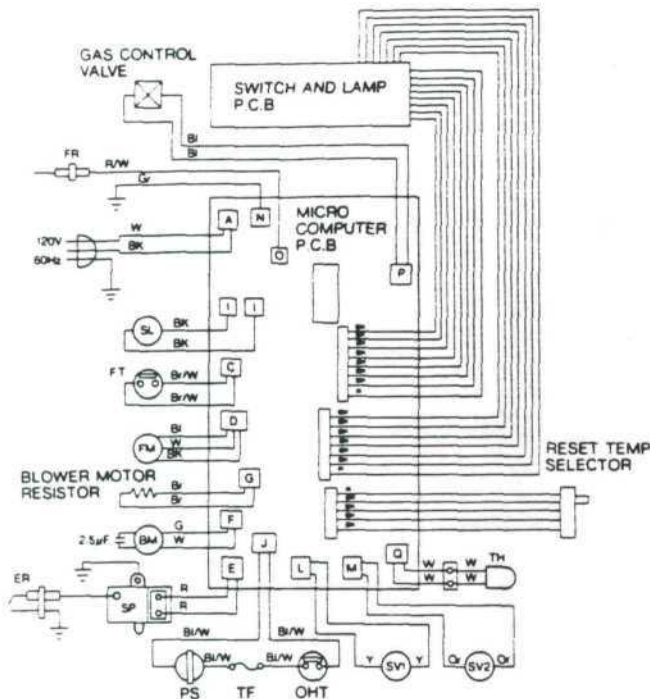




# MONITOR HEATING SYSTEM

## Section 6: Electrical System

### WIRING DIAGRAM

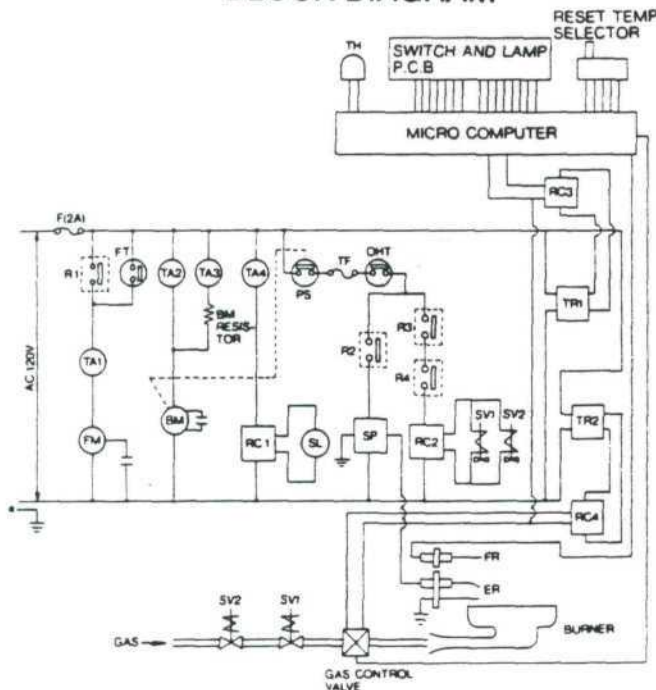


### CAUTION:

- Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.
- If any of the original wire as supplied with the appliance must be replaced, it must be replaced with a wire of at least a 105°C temperature rating.

CODE	COLOR
Bk	Black
Bl	Blue
Br	Brown
G	Gray
Or	Orange
R	Red
W	White
Y	Yellow
Gr	Green

### BLOCK DIAGRAM



MARK	PARTS NAME
BM	COMBUSTION BLOWER MOTOR
ER	ELECTRODE
F	CURRENT FUSE
FM	CIRCULATION FAN MOTOR
FR	FLAME ROD
FT	FAN THERMOSTAT
OHT	OVERHEAT THERMOSTAT
PS	AIR PRESSURE SWITCH
RC1-4	RECTIFICATION CIRCUIT
R1-4	RELAY
SL	SOLENOID
SP	SPARKER
SV1	SOLENOID VALVE 1
SV2	SOLENOID VALVE 2
TA1-4	TRIAC
TF	THERMAL FUSE
TH	THERMISTOR
TR1	TRANSFORMER 1
TR2	TRANSFORMER 2

※ Grounded inside chassis at bottom of unit.

# MONITOR HEATING SYSTEM Parts List

NO.	PARTS NAME	PARTS NO.	QTY	REMARKS	NO.	PARTS NAME	PARTS NO.	QTY	REMARKS
1	ADJUSTABLE LEG	5019	4		33	AIR LINE A	6633	1	
2	TRAY	6602	1		34	IGNITION TRANSFORMER	6634	1	
3	AIR SUPPLY HOSE A	6301	1		35	PRESSURE DETECTIVE PIPE	6635	1	
4	AIR SUPPLY HOSE B	6302	1		36	BURNER ASSY	6637	1	
5	AIR LINE B	6603	1		37	MIXING PLATE ASSY	6638	1	
6	O RING (P10)	6604	1		38	BURNER PORT ASSY	6639	1	
7	AUTOMATIC GAS VALVE ASSY	6605	1		39	FLAME HOLDER	6640	1	
8	GAS CONTROL VALVE	6607	1		40	BURNER PACKING	6641	1	
9	GAS INLET JOINT	6608	1		41	ORIFICE HOLDER	6642	1	
10	O RING (P11)	6609	1		42	ORIFICE GUIDE	6643	1	
11	GAS PIPE JOINT	6610	1		43	GASKET 4	6644	1	
12	O RING (S16)	6611	1		44	BLOWER ASSY	6645	1	
13	RETURN PIPE	6612	1		45	BLOWER MOTOR	6348	1	
14	O RING (P4)	6613	1		46	BLOWER CAPACITOR	6322	1	
15	GASKET 1	6614	1		47	SOLENOID	6406	1	
16	BURNER CHAMBER ASSY	6615	1		48	SUCTION CASE A ASSY	6324	1	
17	WINDOW PACKING	6616	1		49	SEAL PACKING	6144	2	
18	MICA PLATE	6617	1		50	PWB SPACER CLIP A	6461	2	
19	MICA HOLDER	6618	1		51	PWB SPACER CLIP B	6462	14	
20	PLUG BASE ASSY	6619	1		52	PWB ASSY	6646	1	
20-1	FLAME DETECTIVE PLUG ASSY	6620	1		53	CABINET ASSY	6647	1	
20-2	IGNITION ELECTRODE ASSY	6621	1		54	RUBBER BUSH	6136	2	
20-3	PLUG HOLDER	6622	1		55	STRAIN RELIEF BUSHING	4833	1	
20-4	PLUG PACKING	6623	1		56	POWER SUPPLY CORD	6648	1	
21	GASKET 5	6624	1		57	CARRYING HANDLE	6138	2	
22	GASKET 6	6625	1		58	SENSOR ASSY	6186	1	
23	COMBUSTION CHAMBER ASSY	6626	1		59	SLIDE SWITCH ASSY	6649	1	
24	GASKET 7	6627	1		60	SLIDE SWITCH PANEL	6207	1	
25	CHAMBER CAP ASSY	6628	1		61	KNOB	6208	1	
26	GASKET 8	6313	1		62	METAL WIRE WAY B	6455	1	
27	HEAT EXCHANGER ASSY	6629	1		63	METAL WIRE WAY A	6455	1	
28	GASKET 9	6122	1		64	FAN ASSY	6075	1	
29	EXHAUST DUCT ASSY	6630	1		65	CIRCULATION MOTOR	6453	1	
30	O RING (P39)	6176	1		66	BLOWER GUARD ASSY	6454	1	
31	GASKET 2	6631	1		67	UNDER COVER	6332	1	
32	AIR PRESSURE SWITCH	6632	1		68	LOUVER ASSY	6409	1	

NOTE : TO OBTAIN PARTS, CONTACT YOUR DEALER OR,

MONITOR PRODUCTS, INC. Toll free (800) 524-1102 or (609) 584-0505



# MONITOR HEATING SYSTEM

## Parts List

NO.	PARTS NAME	PARTS NO.	QTY	REMARKS	NO.	PARTS NAME	PARTS NO.	QTY	REMARKS
69	CONTROL COVER	6650	1						
70	FRONT COVER	6457	1						
71	LAMP PANEL	6458	1						
72	SWITCH & LAMP ASSY	6651	1						
73	FAN THERMOSTAT	6152	1						
74	OVERHEAT THERMOSTAT	6463	1						
75	THERMAL FUSE	6652	1						
76	TOP COVER	6337	1						
77	WALL CLAMP	6194	2						
78	VENT CONNECTOR	4004	1						
79	PIPE HOLDER	4006	1						
80	AIR SUPPLY HOSE ASSY	6145	1						
81	FLUE PIPE ASSY	6147	1						
82	SCREW CAP ASSY	6148	1						
83	OUTSIDE FLANGE	6148	1						
84	OUTSIDE PACKING	6148	1						
85	EXHAUST OUTLET CAP	4014	1						
86	AIR PORT O RING	4016	1						
87	AIR OUTLET CAP	4805	1						
88	HOSE BAND	4008	2						
89	AIR DAMPER NAT S	6653	1						
90	AIR DAMPER NAT E	6654	1						
91	AIR DAMPER LP S	6655	1						
92	AIR DAMPER LP E	6656	1						
93	ORIFICE (NAT GAS)	6657	1						
94	ORIFICE (LP GAS)	6658	1						
95	GAS PIPE ASSY	6659	1						
96	OWNER'S GUIDE	6660	1						
97	MANUAL GAS VALVE	6601	1						
98	MANIFOLD TEST PLUG	—	1						
99	ORIFICE (2-6000FT NAT)	6661	1						
100	ORIFICE (2-6000FT LP)	6662	1						

NOTE : TO OBTAIN PARTS, CONTACT YOUR DEALER OR,  
MONITOR PRODUCTS, INC. Toll free (800) 524-1102 or (609) 584-0505